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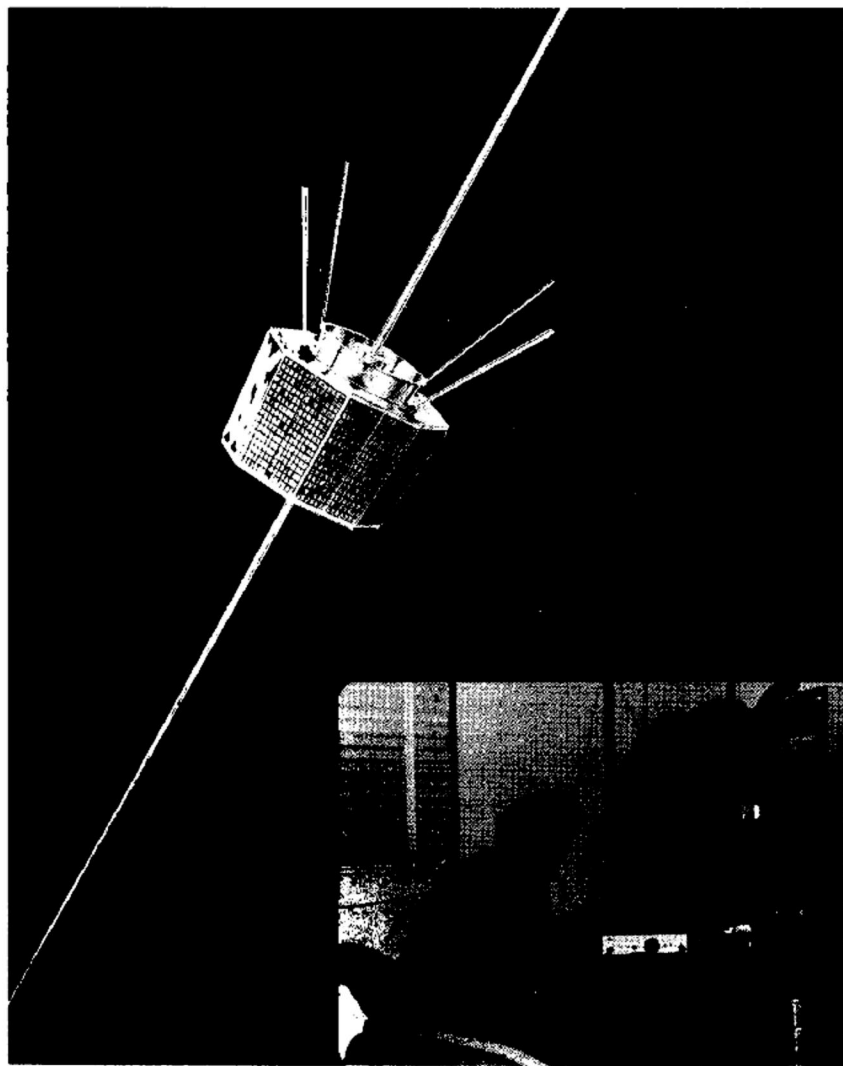
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Reflecting the international aspect of AMSAT-OSCAR 7, the cover picture shows G3ZCZ at his station in Maryland USA in a photograph taken by VK1RY set against a background of an artist's impression of AMSAT-OSCAR 7 in orbit over the Southern Hemisphere.



EDITORIAL

THE INFORMATION GAP

With two spacecraft in orbit and activity through them in over 87 countries by almost 3000 amateur stations, the cries of "how," "where" and "when" are still heard.

In the past we have sent out photographs for reprint to our member societies and other national radio societies. Now we are in a position to supply both written material as well as photographs about most aspects of Amateur Space Activities. If you tell us what you need, at what level and when, we shall supply it.

It is hoped that with adequate publicity about AMSAT-OSCAR activities (from the beginner to the advanced level) many more amateurs will join in the fun and become users of our spacecraft (and possibly AMSAT members).

Joe Kasser
G3ZCZ

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SEVENTH AMATEUR SPACECRAFT IN ORBIT

OSCAR 7 LAUNCHED

by Joe Kasser, G3ZCZ/W3

November 15, 1974, was a special day for Perry Klein, K3JTE, the president of AMSAT, the Radio Amateur Satellite Corporation, for not only was it the day on which the AMSAT-OSCAR 7 spacecraft was launched, it was his birthday.

To cover the launch, two telephone circuits and a number of short wave radio frequencies were employed. The Spacecraft command station conference circuit linked VK3ZDH in Australia, VE3QB in Ottawa, VE2BYG in Bagotville, with K3JTE and W3GEY at the Goddard Spaceflight Center in Maryland. The Net conference circuit linked W3ZM (operated at W3KMY), the AMSAT net control station, W1AW, the American Radio Relay League net station, WA3NAN, the club station at the Goddard Spaceflight Center, W6AB the club station at the Western Test Range and WA4DGU at the Goddard Spaceflight Center. W6AB, W3ZM and WA3NAN between them, transmitted the launch proceedings on the 15, 20, 40, and 75 Meter Bands, while on 20 Meters, WA4JID relayed W3ZM towards Europe.

In the Washington, D.C. area, where AMSAT has its headquarters, the proceedings were also transmitted on the 2 Meter repeater maintained by AMSAT. This link was used as an intercom circuit and a special receiver was set up by WA3JDY (now W4ART) so that some FCC officials could listen in to the launch proceedings. Unfortunately, a tube failed in the W3ZM two meter transmitter and all that the FCC officials heard was an apparently unmodulated repeater carrier. When this was discovered, WA3NAN took over the 2 Meter relay and all the remaining activity was available in the D.C. area.

At 1711 GMT the voice of Dick Daniels (WA4DGU) echoed around the world, "5, 4, 3, 2, 1, 0 . . . we have lift off!" and AMSAT-OSCAR 7 was off. Up, up and away flew the Delta rocket carrying AMSAT-OSCAR 7, the NOAA 4 weather satellite and the Spanish INTASAT.

The first spacecraft to be separated from the rocket was the NOAA 4 weather satellite, then came the turn of AMSAT-OSCAR 7. Separation was confirmed, and all frequencies became silent as everyone waited for confirmation of telemetry reception.

Within a minute of separation G3IOR who was in contact with W3ZM on 20 Meters, reported that he was receiving telemetry from the 435.1 MHz beacon. GB2SM then confirmed reception of signals from AMSAT-OSCAR 7. Conditions on 20 Meters were not very good and so DJ3OS, DL9GU, and DJ8IM telephoned in to the AMSAT phone operated by W3ASK, with telemetry information. Minutes later DK2ZF telephoned in a complete telemetry frame, reporting that he had first acquired signals from the spacecraft at 1828:46 GMT. His telemetry data were,

183	175	195	199	244	201	201	270	300	370	344	351
455	450	456	456	544	501	548	550	602	655	602	651

HI. HI.

showing that all values were nominal and the spacecraft was performing as anticipated. The first report of reception from North America came from K7BBO who reported receiving signals at 1846:37 GMT.



The condensation trail of the launch vehicle is shaped by the wind, (photo by K6PGX)

(Continued on Page 7)

AMSAT-OSCAR 7 FINAL TELEMETRY PARAMETERS AND EQUATIONS

by Jan King, W3GEY (Project Manager)

This article provides the finalized AMSAT-OSCAR 7 spacecraft telemetry data and a description of each of the types of data being telemetered (e.g., temperatures, array current, battery voltage, etc.). The equations and limits given are a result of the final testing and tuning operations that took place a few days before the launch. It is, therefore, recommended that stations who intend to develop look-up telemetry tables and computer programs for data reduction utilize these sets of equations. Similar data published in the September 1974 AMSAT Newsletter and other sources are superceded by this information.

Solar Panel Currents - Channels MC-1B, 1C, 1D, 2A, TT-01, 02, 03, 04, 06, 07, 08, 09, 21, 22, 23, 24, 26, 27, 28, 29, 41, 42, 43, 44, 46, 47, 48, and 49. Solar panel currents provide a means of roughly measuring the attitude of the spacecraft with respect to the sun vector as well as allowing a means of evaluating the performance of each solar panel quadrant. This data is measured once per frame by the Morse Code encoder and is supercommutated six times per frame by the teletype encoder to allow more accurate determination of the spacecraft spin rate. During early orbits of the mission, even this sampling rate will be too slow to measure the period and the teletype encoder dwell mode will be used to dwell on one of the solar panel current channels.

The spacecraft arrays are arranged two panel per spacecraft facet and two facets per quadrant. It is the sum of the currents from the four paralleled panels comprising one quadrant that is telemetered. The maximum current from each quadrant (as measured during solar simulation testing) is:

$$\begin{aligned} I_{+X_{\max}} &= 1445 \text{ ma} & I_{-X_{\max}} &= 1452 \text{ ma} \\ I_{+Y_{\max}} &= 1445 \text{ ma} & I_{-Y_{\max}} &= 1499 \text{ ma} \end{aligned}$$

and the relationship between the quadrant current and the corresponding angle between the sun vector and the spacecraft axis being measured is:

$$\text{Measured Current} = I_{X,Y} = \frac{I_{X,Y_{\max}}}{2} \{ \cos(\theta_{X,Y} + 22\frac{1}{2}^\circ) + \cos(\theta_{X,Y} - 22\frac{1}{2}^\circ) \}$$

(with the limitation that for $\cos(\theta \pm 22\frac{1}{2}^\circ) < 0$ use 0+ negative currents not allowed).

This angle may be written as:

$$\theta_{X,Y} = \cos^{-1} \left\{ \frac{I_{X,Y}}{I_{X,Y_{\max}}} \cdot \frac{1}{\cos 22\frac{1}{2}^\circ} \right\} = \cos^{-1} \left\{ 1.082 \frac{I_{X,Y}}{I_{X,Y_{\max}}} \right\}$$

in terms of the current measured and the maximum current possible for each quadrant. The calculated angles can then be checked to assure that you have calculated the attitude of the spacecraft with respect to the sun properly by using the direction cosines identity:

$$\cos^2 \theta_X + \cos^2 \theta_Y + \cos^2 \theta_Z = 1.$$

Total Solar Array Current - Channels MC-1A and TT-34. These channels represent the total current being collected from all of the solar panels at the instant the measurement is made. Currents as high as 2.3 amps are possible, but typical currents will run between 1.0 and 2.0 amps. The arrays are wired at 6.4V giving a maximum possible power from the arrays of 14.7 watts.

Z Axis Sensors - Channels TT-5, 10, 25, 30, 45, 50. A small patch of solar cells is located on the top and bottom of the spacecraft to provide an indication of the attitude of the Z axis (spin axis) with respect to the sun. The -Z axis sensor experiences considerable blockage due to the attach ring that held the spacecraft to the launch vehicle.

*See discussion of Z axis sensor.

Battery Voltage - Channels MC-3A, TT-11 and 51. The battery in AMSAT-OSCAR 7 uses 10 NiCd cells. Since the battery is always kept near a fully charged state, the voltage will normally stay between 13 and 15V. This is due to the fact that the spacecraft maintains a net positive power budget. That is, the arrays produce more power during an orbit than the spacecraft loads consume. The unused current is used to maintain the battery in a charged state. If, for some reason, the battery voltage drops to a voltage of 12.1V, the spacecraft will automatically be placed in Mode D by the undervoltage protection circuits. A lower limit cut-off of 12.4V has been established, however, at which it is desirable to manually switch the spacecraft to Mode D for a period of 24 hours for recharging purposes.

Battery Half Voltage - Channels MC-3B, TT-12 and 52. The voltage at the top of the 5th cell of the ten-cell battery is telemetered to provide information on cell imbalance. If the battery is performing normally, $V_{1/2BAT}$ should track very closely (V_{BAT}):2. Any discrepancy is an indication that one or more cells in the battery is changing characteristics.

Battery Charge-Discharge Current - Channels MC-2D and TT-20. The net charge or discharge current of the battery indicates if the battery must make up current to the loads not available from the solar arrays or whether excess current is available from the arrays. In Mode D, charge currents as high as 1000ma might be seen by this sensor, while in Mode B with the spacecraft in eclipse, the discharge current on peaks may exceed 1500ma. Repetitive measurements at high discharge rates in sunlight should be reported immediately since this may indicate some failure within the power system.

Spacecraft Power Regulators/Converters - Channels MC-5D, TT-13, 14 and 15. The spacecraft contains several power supplies to provide voltages and voltage references other than the nominal battery voltage of 13 to 15 volts. Important voltages and currents from these regulators/converters are monitored. With the exception of the 28V converter whose output is not regulated (and thus varies with the battery voltage), these parameters should remain constant (with only a few counts plus or minus change due to temperature or component aging.) The 9V and 28V regulators are turned off in all modes except Mode A since they provide regulated voltages for the 2/10 repeater. The instrumentation switching regulator current should remain constant but will indicate a current of 54ma in Modes A and D and 27ma in Modes B and C. In the event of a failure of one of the regulators, these telemetry points should allow us to quickly locate the problem.

Battery Charge Regulators - Channels MC-3C, TT-16 and 17. Perhaps one of the most critical components of AMSAT-OSCAR 7 is the Battery Charge Regulator (BCR). The BCR is responsible for converting the array power (generated at 6.4V) to power used to charge the battery or delivered directly to the loads (at 13 to 15V). This must be done at very high efficiency so as not to waste the array power as heat in the regulator itself. The BCR must also prevent the battery from overcharging when it becomes fully charged. It accomplishes this by unclamping the solar arrays (which act as a constant current source) and allowing the array voltage to increase. The net effect of this action is to reduce the current supplied to the battery to a safe trickle level. (In the region above 6.5V the arrays can no longer act as constant current generators.)

Because the reliability of this special regulator is so important, the spacecraft includes two such devices and an automatic switchover circuit which senses the failure of one of the regulators and switches to the other. In addition to the automatic circuit, there is a manual command capability so that it is possible to switch regulators from the ground. The performance of the regulators is determined by monitoring the input voltage of each regulator as well as the array currents and battery charge-discharge current. The normal conditions for the regulators are as follows:

	<u>During Sunlight</u>	<u>During Eclipse</u>
<u>Battery Charging</u>		
on-line regulator	6.4V	2.5V
standby regulator	4.8V	4.5V
<u>Battery Fully Charged</u>		
on-line regulator	8.5V	2.5V
standby regulator	5.0V	4.5V

Note that as the battery becomes fully charged, the on-line regulator voltage increases, which decreases the current that the arrays will deliver to the battery. The Morse Code telemetry encoder monitors only regulator #1, the regulator expected to be used a majority of the time.

Spacecraft Temperature Sensors - Channels MC-3D, 4A, 4B, 4C, 4D, 5A, 5C, TT-00, 35, 36, 37, 38, and 39. All thermistors on board AMSAT-OSCAR 7 measure temperature in an inverse manner--the higher the count the lower the temperature. Note that the equations for the teletype encoder differ from those of the Morse Code encoder. A loading effect (caused by a lower effective input impedance of the teletype encoder than was originally calculated) was not caught until late in the testing program. The net effect is to make the equation slightly non-linear. Both equations are now considered very accurate and measurements of temperature with the teletype system should be within ± 0.15 degrees C.

Temperatures of the spacecraft will be quite a bit lower than those of OSCAR 6 and other previous OSCAR satellites. The average temperature of the spacecraft electronics will be near 15°C , while the battery should stay at about 20°C (room temperature). Solar array panels and the +Z and -Z surfaces may vary considerably in temperature over the range 0°C to 40°C . The 70cm-to-2m power amplifier and modulator temperatures will tend to run warmer than the rest of the electronics. The two-to-ten meter repeater P.A. temperature will typically reach 40°C after it has been turned on for several minutes.

Transmitter RF Power Outputs - Channels MC-2B, 6A, 6B, 6C, TT-19, 31, 32, and 33. Perhaps the most inaccurate telemetry sensors and the ones most difficult to calibrate, the transmitter R.F. power monitors provide a rough measurement of power output of the repeaters and beacon transmitters. These measurements are difficult primarily because the measurement is a function of load impedance, and it is difficult to determine the exact impedance of the antennas in the free space environment. This is particularly true in the case of the ten-meter antenna. The power output channel of the two-to-ten meter repeater was calibrated once the spacecraft was in orbit by comparing measurements on the power channel with those of the P.A. emitter current, which is less sensitive to final stage tuning effects. The equation for this channel is only a best estimate and is only useful as a relative indicator of power. The power outputs of the two repeaters will change considerably at times (since their output power is proportional to the sum of the input signals), while the beacon transmitter outputs should remain constant. Keep in mind that the power monitors are measuring the average power and not the peak envelope power. The P.E.P. power is considerably higher, so if the 70cm-to-2m repeater is reading 00 counts (8W in Mode B)* this represents the average power out--and someone is badly overloading the repeater! The offender should be identified and asked to back off his power.

Repeater AGC Measurements - Channels TT-53 and 58. The AGC monitors represent another method of measuring the repeater usage. The equations for these channels are set up to give the amount of gain reduction the active repeater is experiencing at the time of the measurement (in dB). If Channel TT-53 indicates that a strong station activates the AGC by, say -5dB, then this means that all stations in the passband are reduced in signal level by 5dB due to AGC action. The maximum dynamic range of the repeaters is approximately 28dB; thus, the gain of the repeaters may only be reduced by a maximum of -28dB. If a station is so strong as to saturate the AGC, then the repeater system is no longer linear and considerable distortion of all passband signals will result. In addition, under such conditions both repeaters draw very high currents from the spacecraft battery (as much as 1.6 to 2 Amps in Mode B).

Spacecraft 24-hour Clock - Channel MC-2C. The switchover between Modes A and B is accomplished by a crystal controlled clock. The clock is formed by a 3.181457 MHz oscillator and 39 divide-by-two stages. The period of the last divide-by-two stage is 48 hours (which is the completed cycle time for the repeaters). The last six stages of the divider chain form together with a resistor ladder network, a coarse digital-to-analog converter. When the clock is reset, the analog output of the clock reads 00 counts. Just before switchover, the output is 95% of full scale or 95 counts. Keep in mind that the purpose of the clock is to give a general indication that the clock is working and approximately where in the 24-hour period it is. Since the output is then reconverted to a digital count by an analog-to-digital converter in the Morse Code telemetry encoder, the value is inherently uncertain by ± 1 count. Thus, between two frames one may observe the clock to actually decrease by one count. It should be observed that over many frames,

*In Mode A and D, MC-2B will generally read 00 or 01 counts. This is simply an indication that the repeater is off, and not that it is on and running at full power!

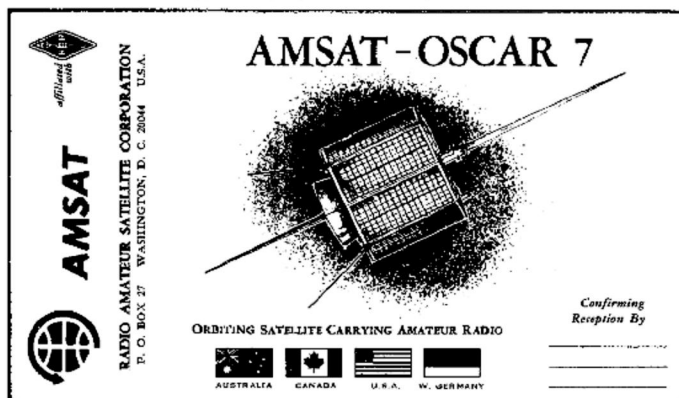
however, the count should vary about a mean value. The clock should increment approximately one count every 15 minutes, since there are 96 fifteen-minute intervals per day.

Repeater Test Points - Channels MC-5B, TT-54, 55, 56, 57, and 59. Test points are provided from both repeaters which monitor critical performance parameters. Some, such as the oscillator test points, will indicate a constant value whenever the 70cm-to-2m repeater is on, while others, such as the two-to-ten meter repeater P.A. emitter current, or the modulator output or envelope level of the 70cm-to-2m repeater, will indicate accurately the user activity on the active repeater.

Calibration Channels - Channels MC-6D, TT-18 and 40. A precision, temperature compensated, voltage reference is generated by the instrumentation switching regulator and is provided as the reference voltage for the thermistors as well as the calibration input to both telemetry encoders. The value of this reference is 0.497V and should be accurate to within ± 0.001 volts. An additional channel is used on the teletype telemetry encoder to verify the zero point of the dual slope integrator utilized as part of the analog-to-digital converter.

AMSAT-OSCAR 7 QSL CARDS

This beautiful multicolored QSL card is available from AMSAT in return for your reception report of the AMSAT-OSCAR 7 satellite. The cards were donated by K5FZU and the Hesse Envelope Company of Dallas, Texas.



(Continued from Page 3)

A special RTTY Link took place on the 20 Meter band between K3IVO and PA0AA. The amateurs at PA0AA, the club station of VERON, the Netherland Amateur Radio society, had built a special computer that would receive the telemetry from the spacecraft which was being transmitted in Morse code, automatically convert the Morse code to RTTY code and transmit it on the 20 Meter band. K3IVO monitored their transmissions and relayed the data on 2 Meters into the Washington area.

The Spanish built INTASAT was placed into orbit a few minutes after the separation of AMSAT-OSCAR 7.

AMSAT-OSCAR 7 is an international spacecraft in the true sense of the word for it was designed and built by amateurs in the USA, Canada, Germany and Australia. The design was coordinated by AMSAT and final assembly took place in the basement of Jan King, W3GEY.

MC Ch.	Parameter	Red Line Lower Limit		Typical		Red Line Upper Limit		Equation
		Value	Count	Value	Count	Value	Count	
1A	Total Array Cur.	N/A		0 to 2300ma	0 to 78	N/A		$I_T=29.5N$ (ma)
1B	+X Quad. Cur.	N/A		0 to 1500ma	99 to 23	N/A		$I_{+X}=1970-20N$ (ma)
1C	-X Quad. Cur.	N/A		0 to 1500ma	99 to 23	N/A		$I_{-X}=1970-20N$ (ma)
1D	+Y Quad. Cur.	N/A		0 to 1500ma	99 to 23	N/A		$I_{+Y}=1970-20N$ (ma)
2A	-Y Quad. Cur.	N/A		0 to 1500ma	99 to 23	N/A		$I_Y=1970-20N$ (ma)
2B	70/2 Pwr Out	0.5W	75	2.5W	44	8.0W	00	$P_{70/2}=8(1-0.01N)^2$ (W)
2C	24 Hr. Clock Time	0 hrs	0	0 to 24hrs	0 to 95	24hrs	95	$t=0.253N$ (hrs.)
2D	Bat. Ch.-Dis. Current	-1200ma	20	-400 to +400ma	40 to 60	1000	75	$I_B=40(N-50)$ (ma)
3A	Bat. Voltage	12.4V	60	13.6 to 15.1V	72 to 87	15.5V	91	$V_{BAT}=0.1N+6.4$ (volts)
3B	1/2 Bat. Voltage	6.2V	62	6.8 to 7.6V	68 to 76	7.8V	78	$V_{1/2BAT}=0.10N$ (volts)
3C	Bat. Ch. Reg. #1 Voltage	2.3V	15	6.4 to 7.5V	42 to 50	9.0V	60	$V_{CRL}=0.15N$ (volts)
3D	Bat. Temp.	5°C	61	20°C	51	35°C	41	$T_{BAT}=95.8-1.48N$ (°C)
4A	Baseplate Temp.	0°C	65	18°C	53	40°C	38	$T_{BP}=95.8-1.48N$ (°C)
4B	PA Temp. 2/10 Rptr.	5°C	61	40°C	38	60°C	24	$T_{10}=95.8-1.48N$ (°C)
4C	+X Facet Temp.	-5°C	68	10 to 30°C	58 to 44	60°C	24	$T_{+X}=95.8-1.48N$ (°C)
4D	+Z Facet Temp.	0°C	65	10°C	58	40°C	38	$T_{+Z}=95.8-1.48N$ (°C)
5A	PA Temp. 70/2 Rptr.	5°C	61	28°C	46	60°C	24	$T_2=95.8-1.48N$ (°C)
5B	PA Emit. Current 2/10 Rptr.	35.0ma	03	140ma	12	175ma	15	$I_{10}=11.67N$ (ma)
5C	Mod. Temp. 70/2 Rptr.	5°C	61	28°C	46	60°C	24	$T_m=95.8-1.48N$ (°C)
5D	Instr. Sw Req. Input Current	23.3ma	15	27.4ma to 53.6ma	20 to 52*	60.2ma	60	$I_{ISR}=11+0.82N$ (ma)

FINAL PARAMETERS AND EQUATIONS - TELETYPE TELEMETRY SYSTEM

Channel No. $\overline{XX123}$

TT Ch.	Parameter	Red Line Lower Limit Value	Typical Value	Count	Red Line Upper Limit Value	Equation
00	PA Temp. -70/2	5°C	28°C	422	60°C	$T_F = 0.001271 - 6.756/N + 95.79(^{\circ}\text{C})$
01	+X Quad. Current	N/A	0 to 1500ma	910 to 225	N/A	$I_{+X} = 1995 - 2.191N(\text{ma})$
02	+Y Quad. Current	N/A	0 to 1500ma	904 to 215	N/A	$I_{+Y} = 1968 - 2.175N(\text{ma})$
03	-X Quad. Current	N/A	0 to 1500ma	908 to 210	N/A	$I_{-X} = 1953 - 2.150N(\text{ma})$
04	-Y Quad. Current	N/A	0 to 1500ma	908 to 210	N/A	$I_{-Y} = 1954 - 2.150N(\text{ma})$
05	+Z Axis Sensor	N/A	0 to 90°	0 to 1000	N/A	$\theta_{-Z} = \cos^{-1} \left(\frac{N}{1000} \right) (\text{deg})$
06	+X Quad. Current	N/A	0 to 1500ma	910 to 225	N/A	$I_{+X} = 1995 - 2.191N(\text{ma})$
07	+Y Quad. Cur.	N/A	0 to 1500ma	904 to 215	N/A	$I_{+Y} = 1968 - 2.175N(\text{ma})$
08	-X Quad. Current	N/A	0 to 1500ma	908 to 210	N/A	$I_{-X} = 1953 - 2.150N(\text{ma})$
09	-Y Quad. Cur.	N/A	0 to 1500ma	908 to 210	N/A	$I_{-Y} = 1954 - 2.150N(\text{ma})$
10	-Z Axis Sensor	N/A	0 to 90°	0 to 1000	N/A	$\theta_{-Z} = \cos^{-1} \left(\frac{N}{1000} \right) (\text{deg})$
11	Bat. Voltage	12.4V	13.6V to 15.1V	720 to 870	15.5V	$V_{BAT} = 0.01N + 6.40(\text{volts})$
12	1/2 Bat. Voltage	6.2V	6.8V to 7.6V	650 to 725	7.8V	$V_{1/2BAT} = 0.01045N(\text{volts})$
13	28 Reg. Voltage	20V	23.5V	690	32V	$V_{28} = 0.0340N(\text{volts})$
14	10 Reg. Voltage	9.0V	9.77V	627	11V	$V_{10} = 0.01558N(\text{volts})$
15	9 Reg. Voltage	8.0V	9.1V	910	10V	$V_9 = 0.010N(\text{volts})$
16	Ch. Reg. #1 Voltage	2.32V	6.4V to 7.5V	415 to 487	9.0V	$V_{CR1} = 0.01547N(\text{volts})$
17	Ch. Reg. #2 Voltage	2.30V	6.4V to 7.5V	415 to 487	9.0V	$V_{CR2} = 0.01535N(\text{volts})$
18	Zero Ref.	N/A	0.00V	000	0.02V	$V_0 = 0.01N(\text{volts})$
19	Pwr. Out 2304 Beacon	20mw	41mw	370	100mw	$P_{2304} = 3.0 \left(\frac{N}{100} \right)^2 (\text{mw})$

TT Ch.	Parameter	Red Line Lower Limit Value	Typical Value	Count	Red Line Upper Limit Value	Count	Equation
20	Ch.-Disc. Current	-1200ma	-400 to +400ma	086	1000ma	780	$I_B = 3.17N - 1474 \text{ (ma)}$
21	+X Quad. Current	N/A	0 to 1500ma		N/A		$I_X = 1995 - 2.191N \text{ (ma)}$
22	+Y Quad. Current	N/A	0 to 1500ma		N/A		$I_Y = 1968 - 2.175N \text{ (ma)}$
23	-X Quad. Current	N/A	0 to 1500ma		N/A		$I_{-X} = 1953 - 2.150N \text{ (ma)}$
24	-Y Quad. Current	N/A	0 to 1500ma		N/A		$I_{-Y} = 1954 - 2.150N \text{ (ma)}$
25	+Z Axis Sensor	N/A	0 to 90°		N/A		$\theta + Z = \cos^{-1} \left(\frac{N}{1000} \right) \text{ (deg)}$
26	+X Quad. Current	N/A	0 to 1500ma		N/A		$I_X = 1995 - 2.191N \text{ (ma)}$
27	+Y Quad. Current	N/A	0 to 1500ma		N/A		$I_Y = 1968 - 2.175N \text{ (ma)}$
28	-X Quad. Current	N/A	0 to 1500ma		N/A		$I_{-X} = 1953 - 2.150N \text{ (ma)}$
29	-Y Quad. Current	N/A	0 to 1500ma		N/A		$I_{-Y} = 1954 - 2.150N \text{ (ma)}$
30	-Z Axis Sensor	N/A	0 to 90°		N/A		$\theta - Z = \cos^{-1} \left(\frac{N}{1000} \right) \text{ (deg)}$
31	RF Power Output 2M/10M Repeater	82mw	1.00W	160	2.00W	790	$P_{2/10} = \left(\frac{N}{10} \right)^2 / 1.56 \text{ (mw)}$
32	RF Power Output 70cm/2M Repeater	0.5W	2.5W	750	8W	000	$P_{70/2} = 8(1 - 0.001N)^2 \text{ (W)}$
33	RF Power Output 435 Beacon	180mw	370mw	380	500mw	682	$P_{435} = 0.001N^2 + 35 \text{ (mw)}$
34	Total Solar Array Current	N/A	0 to 2.3A		N/A		$I_T = 3.115(N - 7) \text{ (ma)}$
35	Battery Temp.	5°C	20°C	550	35°C	381	$T_{BAT} = 0.001271N - 6.756/N + 95.79 \text{ (°C)}$
36	Baseplate Temp.	0°C	18°C	577	40°C	352	$T_{BP} = 0.001271N - 6.756/N + 95.79 \text{ (°C)}$

TT Ch.	Parameter	Red Line Lower Limit Value	Count	Typical Value	Count	Red Line Upper Limit Value	Equation
37	+X Facet Temp.	-5°C	604	10 to 30°C	523 to 410	60°C	$T_{+X} = 0.001271 - 6.756/N + 95.79(°C)$
38	+Z Facet Temp.	0°C	577	10°C	523	40°C	$T_{+Z} = 0.001271 - 6.756/N + 95.79(°C)$
39	2304 Beacon Temp.	5°C	550	18°C	478	40°C	$T_{2304} = 0.001271 - 6.756/N + 95.79(°C)$
40	Midrange Telemetry Cal.	494 mV	494	497 mV	497	500 mV	$V_{CAL} = 0.001N$ (volts)
41	+X Quad. Current	N/A		0 to 1500ma	910 to 225	N/A	$I_{+X} = 1995 - 2.191N$ (ma)
42	+Y Quad. Current	N/A		0 to 1500ma	904 to 215	N/A	$I_{+Y} = 1968 - 2.175N$ (ma)
43	-X Quad. Current	N/A		0 to 1500ma	908 to 210	N/A	$I_{-X} = 1953 - 2.150N$ (ma)
44	-Y Quad. Current	N/A		0 to 1500ma	908 to 210	N/A	$I_{-Y} = 1954 - 2.150N$ (ma)
45	+Z Axis Sensor	N/A		0 to 90°	0 to 100	N/A	$\theta_{+Z} = \cos^{-1} \left(\frac{N}{1000} \right)$ (deg)
46	+X Quad. Current	N/A		0 to 1500ma	910 to 225	N/A	$I_{+X} = 1995 - 2.191N$ (ma)
47	+Y Quad. Current	N/A		0 to 1500ma	904 to 215	N/A	$I_{+Y} = 1968 - 2.175N$ (ma)
48	-X Quad. Current	N/A		0 to 1500ma	908 to 210	N/A	$I_{-X} = 1953 - 2.150N$ (ma)
49	-Y Quad. Current	N/A		0 to 1500ma	908 to 210	N/A	$I_{-Y} = 1954 - 2.150N$ (ma)
50	-Z Axis Sensor	N/A		0 to 90°	0 to 1000	N/A	$\theta_{-Z} = \cos^{-1} \left(\frac{N}{1000} \right)$ (deg)
51	Bat. Voltage	12.4V	595	13.6V to 15.1V	715 to 865	15.5V	$V_{BAT} = 0.01N + 6.45$ (volts)
52	1/2 Bat. Voltage	6.20V	589	6.8V to 7.6V	646 to 722	7.8V	$V_{1/2BAT} = 0.01052N$ (volts)
53	AGC Level-70/2	0dB	162	-10dB	700	-29dB	$AGC_{70/2} = 20 \log_{10} (948.9 - N) - 57.92$ (dB)
54	TX OSC.-70/2	75%	750	88%	880	95%	TX OSC=0.1N (%)
55	RX OSC.-70/2	10%	100	24%	238	40%	RX OSC=0.1N (%)

FINAL PARAMETERS AND EQUATIONS - TELETYPE TELEMETRY SYSTEM (continued)

TT Ch.	Parameter	Red Line Lower Limit Value	Red Line Upper Limit Value	Typical Value	Typical Count	Equation
56	Mod. Out.-70/2	0.13V	0.13V	0.26V	200	MOD=0.00128N (volts)
57	Envelope-70/2	0.01V	0.01V	0.15V	150	ENV=0.00128N (volts)
58	AGC Level-2/10	-0.4dB	-0.4dB	-10dB	684	AGC ₂ /10=-10log ₁₀ (2.48N-1680)(dB)
59	Conv. OSC.-70/2	7.50V	7.50V	8.55V	855	CONV=0.01N (volts)

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FINAL PARAMETERS AND EQUATIONS - MORSE CODE TELEMETRY SYSTEM (continued)

MC Ch.	Parameter	Red Line Lower Limit Value	Red Line Upper Limit Value	Typical Value	Typical Count	Equation
6A	RF Pwr Out- 2/10 Rptr.	64mw	64mw	1130mw	42	$P_{2/10} = N^2 / 1.56 \text{ (mw)}$
6B	RF Power Output- 435 Beacon	180mw	180mw	370mw	58	$P_{435} = 0.1N^2 + 35 \text{ (mw)}$
6C	RF Power Out- 2304 Beacon	41mw	41mw	56mw	37	$P_{2304} = 0.041N^2 \text{ (mw)}$
6D	Midrange Tlm calibration	0.49V	0.49V	0.50V	50	$V_{cal} = .01N \text{ (volts)}$

READING THE AMSAT - OSCAR 7 MORSE TELEMETRY

(Revision 1.0)

by Joe Kasser G3ZCZ

After listening to the telemetry for a few minutes it will be obvious that the spacecraft is sending back four three-digit numbers beginning with 1, then four three-digit numbers beginning with 2, and so on. After the fourth number beginning with 6, it sends HI twice and starts again. If the four numbers are called A, B, C, and D, the spacecraft is sending numbers in the following order:

1A	1B	1C	1D	2A	2B	2C	2D	3A	3B	3C	3D
4A	4B	4C	4D	5A	5B	5C	5D	6A	6B	6C	6D

Each of these channels is telling something about the spacecraft as follows:

Ch. MC - 1A = Total Solar Array Current	(mA)
1B = +X Quad. Current	(mA)
1C = -X Quad. Current	(mA)
1D = +Y Quad. Current	(mA)
2A = -Y Quad. Current	(mA)
2B = 70/2 Repeater RF Power Output	(Watts)
2C = 24 Hour Clock Time	(Minutes)
2D = Battery Charge-Discharge Current	(mA)
3A = Battery Voltage	(Volts)
3B = Half Battery Voltage	(Volts)
3C = Battery Charge Reg. #1 Voltage	(Volts)
3D = Battery Temperature	(Degrees C)
4A = Base Plate Temperature	(Degrees C)
4B = 2/10 Repeater PA Temperature	(Degrees C)
4C = +X Facet Temperature	(Degrees C)
4D = +Z Facet Temperature	(Degrees C)
5A = 70/2 Repeater P. A. Temperature	(Degrees C)
5B = 2/10 Repeater P. A. Emitter Current	(mA)
5C = 70/2 Repeater Modulator Temperature	(Degrees C)
5D = Instrument Switching Regulator Input Current	(mA)
6A = 2/10 Repeater RF Power Output	(mW)
6B = 435 Beacon RF Power Output	(mW)
6C = 2304 Beacon RF Power Output	(mW)
6D = Midrange Telemetry Calibration	(N = 50 ± 1 Count)

To decode any channel proceed as follows, using channel 3A as an example. Let 3A read 369.

Locate the Table Column for Channel 3A. Look down the N column until 69 is seen, read across to 3A on the line where N is 69. It will be seen that 3A is equal to 13.3 engineering units. Thus the Battery Voltage of the Spacecraft was 13.3 Volts at the time that the telemetry value was transmitted. If the count following the first digit (N) is an even number, the actual engineering unit value will have to be interpolated from the two nearest odd digit values.

Channel MC-1A appears to be sensitive to RF from the two repeaters and tends to read 00, even in sunlight.

Channels MC-1B, 1C, 1D and 2A are also apparently being affected by RF and tend to read values of the order of 70-79 in darkness. This represents an offset, which changes with repeater loading.

AMSAT - OSCAR 7 Morse Code Telemetry Conversion Table (03102)

REV 1.0	PART 1											
N	1A	13	1C	1D	2A	23	2C	2D	3A	33	3C	3D
1	30.	1950.	1950.	1950.	1950.	7.84	15.	-1960.	6.50	0.10	0.15	24.3
3	89.	1910.	1910.	1910.	1910.	7.53	46.	-1880.	6.70	0.30	0.45	31.4
5	148.	1870.	1870.	1870.	1870.	7.22	76.	-1800.	6.90	0.50	0.75	38.4
7	207.	1830.	1830.	1830.	1830.	6.92	106.	-1720.	7.10	0.70	1.05	45.4
9	266.	1790.	1790.	1790.	1790.	6.62	137.	-1640.	7.30	0.90	1.35	52.5
11	325.	1750.	1750.	1750.	1750.	6.34	167.	-1560.	7.50	1.10	1.65	59.5
13	384.	1710.	1710.	1710.	1710.	6.06	197.	-1480.	7.70	1.30	1.95	66.6
15	443.	1670.	1670.	1670.	1670.	5.78	228.	-1400.	7.90	1.50	2.25	73.6
17	502.	1630.	1630.	1630.	1630.	5.51	258.	-1320.	8.10	1.70	2.55	80.6
19	561.	1590.	1590.	1590.	1590.	5.25	288.	-1240.	8.30	1.90	2.85	87.7
21	620.	1550.	1550.	1550.	1550.	4.99	319.	-1160.	8.50	2.10	3.15	94.7
23	679.	1510.	1510.	1510.	1510.	4.74	349.	-1080.	8.70	2.30	3.45	101.8
25	738.	1470.	1470.	1470.	1470.	4.50	380.	-1000.	8.90	2.50	3.75	108.8
27	797.	1430.	1430.	1430.	1430.	4.26	410.	-920.	9.10	2.70	4.05	115.9
29	856.	1390.	1390.	1390.	1390.	4.03	440.	-840.	9.30	2.90	4.35	122.9
31	915.	1350.	1350.	1350.	1350.	3.81	471.	-760.	9.50	3.10	4.65	129.9
33	974.	1310.	1310.	1310.	1310.	3.59	501.	-680.	9.70	3.30	4.95	137.0
35	1033.	1270.	1270.	1270.	1270.	3.38	531.	-600.	9.90	3.50	5.25	144.0
37	1092.	1230.	1230.	1230.	1230.	3.18	562.	-520.	10.10	3.70	5.55	151.0
39	1151.	1190.	1190.	1190.	1190.	2.98	592.	-440.	10.30	3.90	5.85	158.1
41	1210.	1150.	1150.	1150.	1150.	2.78	622.	-360.	10.50	4.10	6.15	165.1
43	1269.	1110.	1110.	1110.	1110.	2.60	653.	-280.	10.70	4.30	6.45	172.2
45	1328.	1070.	1070.	1070.	1070.	2.42	683.	-200.	10.90	4.50	6.75	179.2
47	1387.	1030.	1030.	1030.	1030.	2.25	713.	-120.	11.10	4.70	7.05	186.2
49	1446.	990.	990.	990.	990.	2.08	744.	-40.	11.30	4.90	7.35	193.3
51	1505.	950.	950.	950.	950.	1.92	774.		11.50	5.10	7.65	200.3
53	1564.	910.	910.	910.	910.	1.77	805.		11.70	5.30	7.95	207.4
55	1623.	870.	870.	870.	870.	1.62	835.		11.90	5.50	8.25	214.4
57	1682.	830.	830.	830.	830.	1.48	865.		12.10	5.70	8.55	221.4
59	1741.	790.	790.	790.	790.	1.34	896.		12.30	5.90	8.85	228.5
61	1800.	750.	750.	750.	750.	1.22	926.		12.50	6.10	9.15	235.5
63	1859.	710.	710.	710.	710.	1.10	956.		12.70	6.30	9.45	242.6
65	1918.	670.	670.	670.	670.	0.98	987.		12.90	6.50	9.75	249.6
67	1977.	630.	630.	630.	630.	0.87	1017.		13.10	6.70	10.05	256.7
69	2036.	590.	590.	590.	590.	0.77	1047.		13.30	6.90	10.35	263.7
71	2095.	550.	550.	550.	550.	0.67	1078.		13.50	7.10	10.65	270.8
73	2154.	510.	510.	510.	510.	0.58	1108.		13.70	7.30	10.95	277.8
75	2213.	470.	470.	470.	470.	0.50	1139.		13.90	7.50	11.25	284.9
77	2272.	430.	430.	430.	430.	0.42	1169.		14.10	7.70	11.55	291.9
79	2331.	390.	390.	390.	390.	0.35	1199.		14.30	7.90	11.85	299.0
81	2390.	350.	350.	350.	350.	0.29	1230.		14.50	8.10	12.15	306.0
83	2449.	310.	310.	310.	310.	0.23	1260.		14.70	8.30	12.45	313.1
85	2508.	270.	270.	270.	270.	0.18	1290.		14.90	8.50	12.75	320.1
87	2567.	230.	230.	230.	230.	0.14	1321.		15.10	8.70	13.05	327.2
89	2626.	190.	190.	190.	190.	0.10	1351.		15.30	8.90	13.35	334.2
91	2685.	150.	150.	150.	150.	0.06	1381.		15.50	9.10	13.65	341.3
93	2744.	110.	110.	110.	110.	0.04	1412.		15.70	9.30	13.95	348.3
95	2803.	70.	70.	70.	70.	0.02	1442.		15.90	9.50	14.25	355.4
97	2862.	30.	30.	30.	30.	0.01	1472.		16.10	9.70	14.55	362.4
99	2921.	-10.	-10.	-10.	-10.	0.00	1503.		16.30	9.90	14.85	369.5

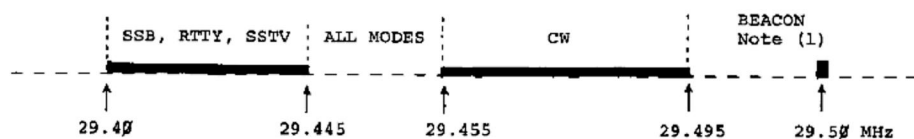
TABLE OF ANTENNA POLARIZATIONS FOR AMSAT-OSCAR 7

SYSTEM	POLARIZATION IN NORTHERN HEMISPHERE	POLARIZATION IN SOUTHERN HEMISPHERE
2/10 repeater <u>uplink</u>	Left-hand circular	Right-hand circular
2/10 repeater <u>downlink</u>	Linear	Linear
70/2 repeater <u>uplink</u>	Right-hand circular	Left-hand circular
70/2 repeater <u>downlink</u>	Right-hand circular	Left-hand circular
435.1 MHz beacon	Left-hand circular	Right-hand circular
2304.1 MHz beacon	Right-hand circular	(antenna shielded from Earth)

AMSAT - OSCAR 7 MORSE CODE TELEMETRY CONVERSION TABLE (G3JGZ)

REV 1.0	PART 2										
N	4A	4B	4C	4D	5A	5B	5C	5D	6A	6B	6C
1	94.3	94.3	94.3	94.3	94.3	12.	94.3	10.2	1.	35.	0.
3	91.4	91.4	91.4	91.4	91.4	35.	91.4	8.5	6.	36.	0.
5	88.4	88.4	88.4	88.4	88.4	58.	88.4	6.9	16.	38.	1.
7	85.4	85.4	85.4	85.4	85.4	82.	85.4	5.3	31.	40.	2.
9	82.5	82.5	82.5	82.5	82.5	105.	82.5	3.6	59.	43.	3.
11	79.5	79.5	79.5	79.5	79.5	128.	79.5	2.0	79.	47.	5.
13	76.6	76.6	76.6	76.6	76.6	152.	76.6	0.3	108.	52.	7.
15	73.6	73.6	73.6	73.6	73.6	175.	73.6	-1.3	144.	58.	9.
17	70.6	70.6	70.6	70.6	70.6	198.	70.6	-2.9	185.	64.	12.
19	67.7	67.7	67.7	67.7	67.7	222.	67.7	-4.6	231.	71.	15.
21	64.7	64.7	64.7	64.7	64.7	245.	64.7	-6.2	283.	79.	18.
23	61.8	61.8	61.8	61.8	61.8	268.	61.8	-7.9	339.	89.	22.
25	58.8	58.8	58.8	58.8	58.8	292.	58.8	-9.5	401.	98.	26.
27	55.8	55.8	55.8	55.8	55.8	315.	55.8	-11.1	467.	108.	30.
29	52.9	52.9	52.9	52.9	52.9	338.	52.9	-12.8	539.	119.	34.
31	49.9	49.9	49.9	49.9	49.9	362.	49.9	-14.4	616.	131.	39.
33	47.0	47.0	47.0	47.0	47.0	385.	47.0	-16.1	699.	144.	45.
35	44.0	44.0	44.0	44.0	44.0	408.	44.0	-17.7	785.	158.	50.
37	41.0	41.0	41.0	41.0	41.0	432.	41.0	-19.3	878.	172.	56.
39	38.1	38.1	38.1	38.1	38.1	455.	38.1	-21.0	975.	187.	62.
41	35.1	35.1	35.1	35.1	35.1	478.	35.1	-22.6	1078.	203.	69.
43	32.2	32.2	32.2	32.2	32.2	502.	32.2	-24.3	1185.	220.	76.
45	29.2	29.2	29.2	29.2	29.2	525.	29.2	-25.9	1298.	238.	83.
47	26.2	26.2	26.2	26.2	26.2	548.	26.2	-27.5	1416.	256.	91.
49	23.3	23.3	23.3	23.3	23.3	572.	23.3	-29.2	1539.	275.	98.
51	20.3	20.3	20.3	20.3	20.3	595.	20.3	-30.8	1667.	295.	107.
53	17.4	17.4	17.4	17.4	17.4	619.	17.4	-32.5	1801.	316.	115.
55	14.4	14.4	14.4	14.4	14.4	642.	14.4	-34.1	1939.	339.	124.
57	11.4	11.4	11.4	11.4	11.4	665.	11.4	-35.7	2083.	360.	133.
59	8.5	8.5	8.5	8.5	8.5	689.	8.5	-37.4	2231.	383.	143.
61	5.5	5.5	5.5	5.5	5.5	712.	5.5	-39.0	2385.	407.	153.
63	2.6	2.6	2.6	2.6	2.6	735.	2.6	-40.7	2544.	432.	163.
65	-0.4	-0.4	-0.4	-0.4	-0.4	759.	-0.4	-42.3	2708.	458.	173.
67	-3.4	-3.4	-3.4	-3.4	-3.4	782.	-3.4	-43.9	2878.	484.	184.
69	-6.3	-6.3	-6.3	-6.3	-6.3	805.	-6.3	-45.6	3052.	511.	195.
71	-9.3	-9.3	-9.3	-9.3	-9.3	829.	-9.3	-47.2	3231.	539.	207.
73	-12.2	-12.2	-12.2	-12.2	-12.2	852.	-12.2	-48.9	3416.	568.	219.
75	-15.2	-15.2	-15.2	-15.2	-15.2	875.	-15.2	-50.5	3606.	598.	231.
77	-18.2	-18.2	-18.2	-18.2	-18.2	899.	-18.2	-52.1	3801.	628.	243.
79	-21.1	-21.1	-21.1	-21.1	-21.1	922.	-21.1	-53.8	4001.	659.	256.
81	-24.1	-24.1	-24.1	-24.1	-24.1	945.	-24.1	-55.4	4206.	691.	269.
83	-27.0	-27.0	-27.0	-27.0	-27.0	969.	-27.0	-57.1	4416.	724.	282.
85	-30.0	-30.0	-30.0	-30.0	-30.0	992.	-30.0	-58.7	4631.	758.	296.
87	-33.0	-33.0	-33.0	-33.0	-33.0	1015.	-33.0	-60.3	4852.	792.	310.
89	-35.9	-35.9	-35.9	-35.9	-35.9	1039.	-35.9	-62.0	5078.	827.	325.
91	-38.9	-38.9	-38.9	-38.9	-38.9	1062.	-38.9	-63.6	5309.	863.	340.
93	-41.8	-41.8	-41.8	-41.8	-41.8	1085.	-41.8	-65.3	5544.	900.	355.
95	-44.8	-44.8	-44.8	-44.8	-44.8	1109.	-44.8	-66.9	5785.	938.	370.
97	-47.8	-47.8	-47.8	-47.8	-47.8	1132.	-47.8	-68.5	6031.	976.	386.
99	-50.7	-50.7	-50.7	-50.7	-50.7	1155.	-50.7	-70.2	6283.	1015.	402.

AMSAT-OSCAR 7 2/10 TRANSPONDER BANDPLAN DOWNLINK FREQUENCIES



NOTES:

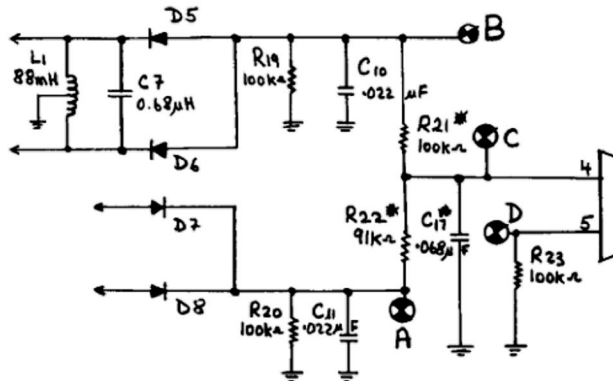
- (1) Guard Channel to avoid interference at any Doppler shift.
- (2) SSB use USB for uplink.
- (3) Recommend ERP = 100 watts.

MODIFYING THE ST-5 FOR AMSAT-OSCAR 7

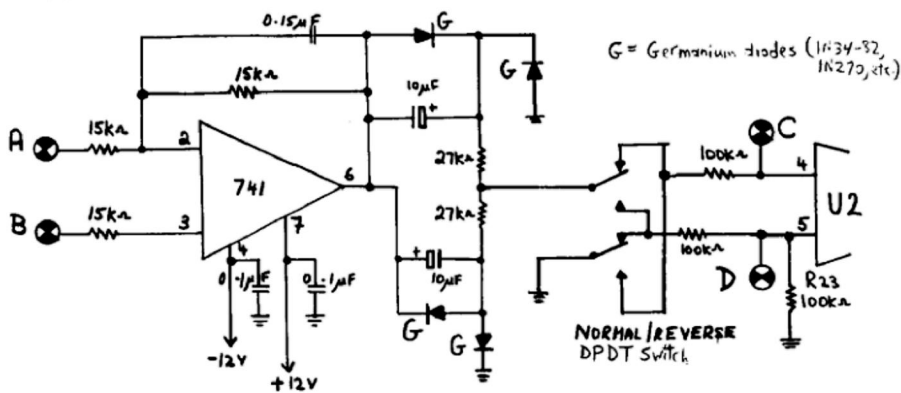
from notes by John Fox, WØLER

The following modifications to your ST-5 teletype terminal unit will allow you to copy the space-keyed telemetry transmitted by the AMSAT-OSCAR 7 spacecraft.

Original circuit (RTTY Journal, May-June 1973).



- (1) Delete components marked * (i.e., R_{21} , R_{22} , C_{17}).
- (2) Reverse diodes D_5 and D_6 .
- (3) Insert the following circuit between points A / B and C / D.



This is the same basic Automatic Threshold Detector circuit used in the ST-6 terminal unit and also described in Ham Radio, November 1973 (Variable Shift RTTY Terminal Unit, by K. Sueker, W3VF).

AMSAT PHONE SERVICE INTERRUPTED

by Joe Kasser, G3ZCZ

Following the successful launch of AMSAT-OSCAR 7, Perry Klein, K3JTE, and family took a well earned vacation in Florida, first having switched the AMSAT phone through to the home of G3ZCZ, the new AMSAT Director of Information and Publicity.

Fay, the wife of G3ZCZ, who up till then had barely learned to cope with such technical terms as receiver, transmitter and single sideband, suddenly came face to face with such new terms as period, inclination, orbital increment and telemetry. As if that weren't enough, Fay was in her ninth month of pregnancy.

In the first few days of answering the phone, Fay learned to cope and answer technical questions; however, on the 24th of November, just as Joe (G3ZCZ) was about to attempt the first mobile to mobile contact through AMSAT-OSCAR 7 with WA3JDY/4, Junior decided to arrive.

With Fay in the hospital and Joe at work or in the car, nobody was home to mind the store. Fay and Joe would like to apologize to those of you who tried to call in and received no answer, and to tell you that their little girl was not named OSCAR.

"Notice of Proposed Amendments to Article III Section 3 of the AMSAT Bylaws"

(approved by the AMSAT Board of Directors November 10, 1974)

Section 3

"Member dues shall be ten dollars (\$10.00 U.S.) per annum. Dues for each additional member of the immediate family shall be two dollars (\$2.00 U.S.) per annum. Annual dues for Member Societies shall be twenty dollars (\$20.00 U.S.) per organization. A discount of ten percent (10%) shall be offered Members applying or renewing through a Member Society. One-half of the annual dues may be waived for any student member under the age of 18 at the time of application. Dues may be waived on an individual basis at the discretion of the Board of Directors. A minimum of one renewal notice shall be sent to Members and Member Societies at least sixty days prior to expiration date of membership. Dues may be prepaid for any number of years, and Life Membership is available for a donation over one hundred dollars (two hundred dollars for a Life Member Society)."

(Underlining indicates new wording)

NOTE: "Changes in the Bylaws of the Corporation shall require approval of two-thirds or more of the Directors. Notice of an amendment which has received such approval shall be circulated to the Members of the Corporation. The amendment shall take effect thirty days after mailing of said notice,* unless written objection is received from at least ten percent of the Membership."

*In the above amendment, the effective date will be July 1, 1975.

70/2 TRANSPONDER NOTES:

- (1) Transmit USB on 70 centimeters; receive LSB on 2 meters.
- (2) Recommended ERP = 80 watts.

AMSAT-OSCAR REFERENCE ORBITS AND OPERATING SCHEDULE

AMSAT-OSCAR 6

Period = 114.99456 minutes

Increment = 28.7490 deg/orbit

Operating schedule

2/10 ON (GMT Days)

EVENINGS

Monday, Thursday, Saturday

MORNINGS

Sunday (EVEN DAYS, Educational demonstrations only)

REV	DATE	TIME	Z	LONG	W
10285	JAN	15	0029.4	56.4	
10298	JAN	16	0124.3	70.6	
10310	JAN	17	0024.3	55.6	
10323	JAN	18	0119.2	49.4	
10335	JAN	19	0019.1	54.4	
10348	JAN	20	0114.1	68.1	
10360	JAN	21	0014.0	53.1	
10373	JAN	22	0108.9	66.8	
10385	JAN	23	0008.9	51.8	
10398	JAN	24	0103.8	65.5	
10410	JAN	25	0003.7	50.5	
10423	JAN	26	0058.7	64.3	
10436	JAN	27	0153.6	78.0	
10448	JAN	28	0053.5	63.0	
10461	JAN	29	0148.5	76.7	
10473	JAN	30	0048.4	61.7	
10486	JAN	31	0153.3	75.5	
10498	FEB	1	0013.3	60.4	
10511	FEB	2	0138.2	74.2	
10523	FEB	3	0038.1	59.2	
10536	FEB	4	0133.1	72.9	
10548	FEB	5	0033.0	57.9	
10561	FEB	6	0127.9	71.6	
10573	FEB	7	0027.9	56.6	
10586	FEB	8	0122.8	70.4	
10598	FEB	9	0022.7	55.3	
10611	FEB	10	0117.6	69.1	
10623	FEB	11	0017.6	54.1	
10636	FEB	12	0112.5	67.8	
10648	FEB	13	0012.4	52.8	
10661	FEB	14	0107.4	66.5	
10673	FEB	15	0007.3	51.5	
10686	FEB	16	0102.2	65.3	
10698	FEB	17	0002.2	50.2	
10711	FEB	18	0057.1	64.0	
10724	FEB	19	0152.0	77.7	
10736	FEB	20	0052.0	62.7	
10749	FEB	21	0146.9	76.4	
10761	FEB	22	0046.8	61.4	
10774	FEB	23	0141.8	75.2	
10786	FEB	24	0041.7	60.2	
10799	FEB	25	0136.6	73.9	
10811	FEB	26	0036.6	58.9	
10824	FEB	27	0131.5	72.6	
10836	FEB	28	0031.4	57.6	
10849	MAR	1	0126.4	71.3	
10861	MAR	2	0026.3	56.3	
10874	MAR	3	0121.2	70.1	
10886	MAR	4	0021.1	55.1	
10899	MAR	5	0116.1	68.8	
10911	MAR	6	0016.0	53.8	
10924	MAR	7	0110.9	67.5	
10936	MAR	8	0010.9	52.5	
10949	MAR	9	0105.8	66.2	
10961	MAR	10	0005.7	51.2	

AMSAT-OSCAR 7

Period = 114.9450 ± 0.0002 minutes

Increment = 28.736 deg/orbit

Inclination = 101.73

Operating Schedule

EVEN DAYS of year Mode B

ODD DAYS of year Mode A

WEDNESDAYS (Education and Bulletin

use only. General communications not permitted. Days designated below by "X".)

REV	DATE	TIME	Z	LONG	W
X 756	JAN	15	0039.4	59.8	
B 769	JAN	16	0133.7	73.3	
A 781	JAN	17	0033.0	58.2	
B 794	JAN	18	0127.3	71.7	
A 806	JAN	19	0026.6	56.6	
B 819	JAN	20	0120.9	70.1	
A 831	JAN	21	0020.3	55.0	
X 844	JAN	22	0110.5	68.5	
A 856	JAN	23	0013.9	53.4	
B 869	JAN	24	0108.2	67.0	
A 881	JAN	25	0007.5	51.8	
B 894	JAN	26	0101.8	65.4	
A 906	JAN	27	0001.1	50.2	
B 919	JAN	28	0055.4	63.8	
X 932	JAN	29	0149.7	77.3	
B 944	JAN	30	0049.0	62.2	
A 957	JAN	31	0143.3	75.7	
B 969	FEB	1	0042.7	60.6	
A 982	FEB	2	0136.9	74.1	
B 994	FEB	3	0036.3	59.0	
A1007	FEB	4	0130.6	72.6	
X1019	FEB	5	0029.9	57.4	
A1032	FEB	6	0124.2	71.0	
B1044	FEB	7	0023.5	55.8	
A1057	FEB	8	0117.8	69.4	
B1069	FEB	9	0017.1	54.2	
A1082	FEB	10	0111.4	67.8	
B1094	FEB	11	0010.8	52.6	
X1107	FEB	12	0105.0	66.2	
B1119	FEB	13	0004.4	51.0	
A1132	FEB	14	0058.7	64.6	
B1145	FEB	15	0152.9	78.1	
A1157	FEB	16	0052.3	63.0	
B1170	FEB	17	0146.6	76.6	
A1182	FEB	18	0045.9	61.4	
X1195	FEB	19	0140.2	75.0	
A1207	FEB	20	0039.5	59.8	
B1220	FEB	21	0133.8	73.4	
A1232	FEB	22	0033.1	58.2	
B1245	FEB	23	0127.4	71.8	
A1257	FEB	24	0026.8	56.6	
B1270	FEB	25	0121.0	70.2	
X1282	FEB	26	0020.4	55.0	
B1295	FEB	27	0114.7	68.6	
A1307	FEB	28	0014.0	53.4	
B1320	MAR	1	0108.3	67.0	
A1332	MAR	2	0007.6	51.8	
B1345	MAR	3	0101.9	65.4	
A1357	MAR	4	0001.2	50.2	
X1370	MAR	5	0055.5	63.8	
A1383	MAR	6	0149.8	77.4	
B1395	MAR	7	0049.1	62.2	
A1408	MAR	8	0143.4	75.8	
B1420	MAR	9	0042.8	60.6	
A1433	MAR	10	0137.0	74.2	

AMSAT-OSCAR 6

AMSAT-OSCAR 7

REV	DATE	TIME Z	LONG W	REV	DATE	TIME Z	LONG W
10974	MAR	11 0100.7	45.0	B1445	MAR	11 0036.4	59.0
10986	MAR	12 0000.6	50.0	X1458	MAR	12 0130.7	72.6
10999	MAR	13 0055.5	63.7	B1470	MAR	13 0030.2	57.4
11012	MAR	14 0150.5	77.4	A1483	MAR	14 0124.3	71.0
11024	MAR	15 0050.4	62.4	B1495	MAR	15 0023.6	55.8
11037	MAR	16 0145.3	76.2	A1508	MAR	16 0117.9	69.4
11049	MAR	17 0045.3	61.1	B1520	MAR	17 0017.2	54.2
11062	MAR	18 0140.2	74.9	A1533	MAR	18 0111.5	67.8
11074	MAR	19 00 0.1	59.9	X1545	MAR	19 0010.9	52.6
11087	MAR	20 0135.1	73.6	A1558	MAR	20 0105.1	66.2
11099	MAR	21 0035.0	58.6	B1573	MAR	21 0004.5	51.0
11112	MAR	22 0129.9	72.3	A1583	MAR	22 0058.8	64.6
11124	MAR	23 0029.9	57.3	B1596	MAR	23 0153.0	78.2
11137	MAR	24 0124.8	71.1	A1608	MAR	24 0052.4	63.0
11149	MAR	25 0024.7	56.0	B1621	MAR	25 0146.7	76.6
11162	MAR	26 0119.6	69.8	X1633	MAR	26 0046.0	61.4
11174	MAR	27 0019.6	54.8	B1646	MAR	27 0140.3	75.0
11187	MAR	28 0114.5	68.5	A1658	MAR	28 0039.6	59.8
11199	MAR	29 0014.4	53.5	B1671	MAR	29 0133.9	73.4
11212	MAR	30 0109.4	67.2	A1683	MAR	30 0033.2	58.2
11224	MAR	31 0009.3	52.7	B1696	MAR	31 0127.5	71.8
11237	APR	1 0104.2	66.0	A1728	APR	1 0026.9	56.6
11249	APR	2 0004.2	50.9	X1721	APR	2 0121.2	70.2
11262	APR	3 0059.1	64.7	A1733	APR	3 0020.5	55.0
11275	APR	4 0154.0	78.4	B1746	APR	4 0114.8	68.6
11287	APR	5 0054.0	63.4	A1758	APR	5 0014.1	53.4
11300	APR	6 0148.9	77.1	B1771	APR	6 0108.4	67.0
11312	APR	7 00 8.8	62.1	A1783	APR	7 0007.7	51.8
11325	APR	8 0143.8	75.9	B1796	APR	8 0102.0	65.4
11337	APR	9 0043.7	60.9	X1808	APR	9 0001.4	50.3
11350	APR	10 0138.6	74.6	B1821	APR	10 0055.6	63.8
11362	APR	11 0038.6	59.6	A1834	APR	11 0149.9	77.4
11375	APR	12 0133.5	73.3	B1846	APR	12 0049.3	62.2
11387	APR	13 0033.4	58.3	A1859	APR	13 0145.5	75.8
11400	APR	14 0128.4	72.0	B1871	APR	14 0042.9	60.6
11412	APR	15 0028.3	57.0	A1884	APR	15 0137.2	74.2
11424	APR	16 0123.2	70.8	X1896	APR	16 0036.5	59.0
11437	APR	17 0023.2	55.8	A1909	APR	17 0130.8	72.6
11450	APR	18 0118.1	69.5	B1921	APR	18 0030.1	57.4
11462	APR	19 0018.0	54.5	A1934	APR	19 0124.4	71.0
11475	APR	20 0112.9	68.2	B1946	APR	20 0023.7	55.8
11487	APR	21 0012.9	53.2	A1959	APR	21 0118.3	69.4
11500	APR	22 0107.8	66.9	B1971	APR	22 0017.4	54.3
11512	APR	23 0007.7	51.9	X1984	APR	23 0111.6	67.8
11525	APR	24 0102.7	65.7	A1996	APR	24 0011.0	52.7
11537	APR	25 0002.6	50.7	B2009	APR	25 0105.3	66.2
11550	APR	26 0057.5	64.4	B2021	APR	26 0004.6	51.1
11563	APR	27 0152.5	78.1	A2034	APR	27 0058.9	64.6
11575	APR	28 0052.4	63.1	B2047	APR	28 0153.2	78.2
11588	APR	29 0147.3	76.9	A2059	APR	29 0052.5	63.0
11600	APR	30 0047.3	61.8	X2072	APR	30 0146.8	76.6
11613	MAY	1 0142.2	75.6	A2084	MAY	1 0046.1	61.4
11625	MAY	2 0042.1	60.6	B2097	MAY	2 0140.4	75.0
11638	MAY	3 0137.1	74.3	A2109	MAY	3 0039.7	59.8
11650	MAY	4 0037.0	59.3	B2122	MAY	4 0134.0	73.4
11663	MAY	5 0111.9	73.0	A2134	MAY	5 0023.4	58.3
11675	MAY	6 0031.9	58.0	B2147	MAY	6 0127.6	71.8
11688	MAY	7 0126.8	71.8	X2159	MAY	7 0027.0	56.7
11700	MAY	8 0026.7	56.7	B2172	MAY	8 0121.3	70.2
11713	MAY	9 0121.7	70.5	A2184	MAY	9 0020.6	55.1
11725	MAY	10 0021.6	55.5	B2197	MAY	10 0114.9	68.6
11738	MAY	11 0116.5	69.2	A2209	MAY	11 0014.2	53.5
11751	MAY	12 0016.4	54.2	B2222	MAY	12 0108.5	67.0
11763	MAY	13 0111.4	67.9	A2234	MAY	13 0007.8	51.9
11775	MAY	14 0011.3	52.9	X2247	MAY	14 0102.1	65.4
11788	MAY	15 0106.2	66.7	A2259	MAY	15 0001.5	50.3
11800	MAY	16 0006.2	51.6	B2272	MAY	16 0055.7	63.8
11813	MAY	17 0101.1	65.4	A2285	MAY	17 0150.0	77.4
11825	MAY	18 0001.0	50.4	B2297	MAY	18 0049.4	62.3
11838	MAY	19 0056.0	64.1	A2310	MAY	19 0145.6	75.8
11851	MAY	20 0150.9	77.8	B2322	MAY	20 0043.0	60.7
11863	MAY	21 0050.8	62.8	A2335	MAY	21 0137.3	74.2
11876	MAY	22 0145.8	76.6	B2347	MAY	22 0036.6	59.1



AMSAT-OSCAR 7 on its way
to a rendezvous with
History!

AMSAT NETS

In order to keep the satellite users in touch with one another and to provide information to newcomers, the following AMSAT nets meet regularly:

North American East Coast 75 Meter Net

Mondays 8:00 p.m. EST (0100Z Tues)
3850 kHz LSB
Net Control W3ZM, W3TMZ or K2GUG

North American West Coast 75 Meter Net

Mondays 8:00 p.m. PST (0400Z Tues)
3850 kHz LSB
Net Control W6OAL or W6EJJ
Note that East Coast and West Coast Nets are on the same frequency, so stations in between should be able to work both.

International 20 Meter Net

Sundays 1800Z*
14,280 kHz USB
Net Control W3ZM, W3TMZ or others

International 15 Meter Net

Sundays 1900Z
21,280 kHz USB
Net Control W3ZM, W3TMZ or others

Western Europe Net

Saturdays 1000Z, Sundays 1015Z
14280 kHz LSB
Net Control G3IOR

JA Net

Mondays 1300Z
3560 kHz LSB
Net Control JALANG

Southeast Asia Net

Thursdays 1300Z
14,320 kHz USB
Net Control JALANG or others

ZL Net

Daily
1900 NZDST
3850 kHz LSB
Net Control ZL1WB

*G3IOR listens at 1730Z for European and African check-ins.

In addition, the frequencies 3850 kHz LSB and 14,280 kHz USB are designated as general watch frequencies for discussions of satellite matters following passes.

In the Washington area, AMSAT traffic is handled via 2 meter FM on 146.85 MHz simplex and through the AMSAT repeater WR3ABU (146.25 to 146.85 MHz).

In southern California, the WR6ACJ repeater (146.25 to 146.85 MHz) has been designated as an official medium for exchanging information relating to the amateur space program. It is suggested that those in other areas also adopt 85 simplex and the 25/85 repeater combination for satellite discussions. In those areas where such repeaters already exist, check with the present inhabitants of the channel to see if they would mind having their facility used for such a constructive purpose as satellite talk. If we all standardize on this frequency combination, it will be much easier to get in touch with one another when traveling.

In London, on Sunday at 1730-1800Z, G8CSI is net control on 144.28 MHz FM.

Readers are requested to inform AMSAT about any corrections, additions or deletions to the above net schedules.

Bulletins of general interest to those interested in amateur satellites are transmitted regularly on OSCAR 6 reference orbits (first orbit of the Greenwich day) at approximately 10 minutes after ascending node. These bulletins are transmitted on a downlink frequency of approximately 29,490 kHz and can be received over most of eastern North America.

ABOUT YOUR MAILING LABEL

Recent changes in your membership expiration date or in your address may not be reflected in your mailing label for this issue, because a package containing several hundred changes and additions was lost in the mail.

We hope to have these changes incorporated into the mailing list in time for the next issue.

FROM THE PRESIDENT'S DESK
by Perry Klein, K3JTE

AMSAT 1974 ANNUAL REPORT

March 1974 saw the fifth anniversary of the founding of AMSAT as a non-profit, tax-exempt, scientific corporation. During this past year, membership increased from 1014 to the present 1628 individuals and member societies in 59 countries, a growth of 61 percent. With the establishment of the new class of Life Membership, AMSAT now has over 109 Life Members.

Highlights of Activity in 1974

The primary activities in 1974 centered around AMSAT-OSCAR 6 operations, and the completion and testing of AMSAT-OSCAR 7 in preparation for launch.

AMSAT-OSCAR 6 has continued to operate successfully and is now beyond its second birthday. To improve operation over Europe and Africa, a telecommand station was initiated in Morocco (CN8BO). Other telecommand stations, notably VE3QB, VE2BYG, W6OAL and VK3ZDH succeeded in automating their telecommand terminals.

User activity with AMSAT-OSCAR 6 in two years of operation can be summarized as follows:

Total number of stations of record completing one or more two-way contacts: 2,854
Total number of countries of record in operation: 87
Total number of U. S. states in operation: 50
Total number of OSCAR Worked All States trophies awarded: 18
Country with highest number of OSCAR users: United States (1,078)
Number of ARRL 1000 Awards issued: 258

Although AMSAT-OSCAR 6 originally had a lifetime objective of one year, there is every indication that it may be possible to obtain another year or two of operation from the spacecraft. Success will largely be dependent upon the continued effectiveness of the OSCAR 6 telecommand stations in Canada, Australia, New Zealand, Morocco and the United States, and the cooperation of satellite users.

During the year, an AMSAT-OSCAR 6 curriculum manual prepared by the Talcott Mountain Science Center under a grant managed by AMSAT was published by ARRL and distributed to educators throughout the United States and abroad. Educational demonstrations involving real-time transmissions via AMSAT-OSCAR 6 were presented in a number of schools. Also in 1974, educational bulletin transmissions were initiated via AMSAT-OSCAR 6, with W2GN, K4TI, W6CG, KJDDA and several others serving as AMSAT Educational Bulletin Stations.

The AMSAT-OSCAR 7 spacecraft was completed during 1974 and underwent extensive environmental testing, which included two thermal-vacuum tests, a solar simulation test and a vibration test, during which considerable data on the expected performance under different extremes of the space environment were obtained.

For the first time for an OSCAR launch, special insurance was secured to cover the spacecraft in the event of an unsuccessful launch. This policy includes the provision that AMSAT-OSCAR 7 be put into the proper orbit (defined as 800±100 nautical miles, with an inclination between 60 and 120 degrees). The purpose of this insurance was to protect AMSAT's cash investment in the spacecraft, which is estimated as approximately \$60,000, and to assure funds to construct a replacement spacecraft should a launch mishap occur.

Also during the year, several AMSAT supportive organizations were formed. These include AMSAT Deutschland e.V. in Germany (DJ4ZC, DJ5KQ, DK8FU and DC7AS as principal officers), Stichting AMSAT Nederland in The Netherlands (PA0WLB, PA0JOZ, PA0JNH, NL314 and PA0EPS as principals of this organization), and the Japan AMSAT Association (JAMSAT) with JA1NET, JA1ANG, JA1ATL and JA1NEZ the founders of this organization. Similar organizations are being formed in Canada and the United Kingdom.

Current Activity

With the launch of AMSAT-OSCAR 7, AMSAT activity will concentrate on the operations support of the two satellites, AMSAT-OSCAR 6 and AMSAT-OSCAR 7. A grant has been obtained from the new ARRL Foundation funding AMSAT in the following tasks:

- A) Furnish information, guidance and advice to the users of AMSAT-OSCAR 6 and 7, which includes the handling of a heavy volume of correspondence and telephone calls.
- B) Encourage and facilitate new public service applications and experiments with AMSAT-OSCAR 6 and 7. As examples of public service applications, demonstrations of OSCAR satellite potential for relaying emergency traffic and involving small portable terminals are envisioned.
- C) Implement satellite scheduling as needed for the ARRL Education Program, experiments and demonstrations.
- D) Maintain coordination with telecommand stations, providing them with advice, information and equipment, and reimbursing them for out-of-pocket operating expenses (electric power, telephone, replacement parts, etc.) as needed.
- E) Supply AMSAT-OSCAR 6 and 7 computer-generated orbital data for WIAW bulletin transmissions, as well as worldwide publication and dissemination of such information.
- F) Collect and analyze spacecraft telemetry data, implementing changes in spacecraft operating modes as required to maximize spacecraft lifetime and use.
- G) Arrange for preparation and publication of information on satellite design, experiments and operation. Examples of such activity in the past include AMSAT's participation in the writing of amateur journal articles, AMSAT's management of the preparation of the Talcott Mountain Science Center OSCAR curriculum, and AMSAT's part in the 1973 ARRL Technical Symposium on Space Communications and the 1974 IEEE International Convention session on Radio Amateur Space Communication.

Future Projects

OSCAR hardware projects are now oriented toward providing communications, telemetry and telecommand packages suitable for future spacecraft, including those designed for applications in higher-altitude (i.e., synchronous, near-synchronous, or synchronous-transfer) orbits. The AMSAT Deutschland group in Marburg, Germany, is well along the way toward completion of prototypes of a ten-watt, 145.9-to-435.1 MHz linear OSCAR repeater, a new, advanced telecommand system, and a digital telemetry system capable of being displayed on a regular television set. Several groups have expressed an interest in applying micro-processor computer technology aboard OSCAR satellites, so that control of the satellite can be reprogrammed from the ground as desired to adapt to different operating situations or experiments.

In the area of automated telecommand of OSCAR satellites, the Canadian and Australian telecommand stations are working toward computer-controlling their operations, and this should bring a flexibility and reliability in OSCAR telecommand unparalleled to date. There appears to be little doubt that digital computers involving microprocessor architecture are going to play a fundamental role both in ground telecommand station operations and in spacecraft on-board programmable control in the future.

MAKE OFFER! Two-year-old satellite -- working OK but needs constant attention -- only used three eve's per week -- pick-up deal only -- make offer -- write AMSAT.

MINUTES OF THE ANNUAL MEETING

9 November 1974

The meeting was called to order by President Perry Klein (K3JTE) at 8:30 p.m., with 45 attendees present. Introductions were made and the first order of business, the 1974 Annual Report, was distributed to those in attendance, a copy of which is printed elsewhere in this Newsletter.

Attention was called to the highlights of the report and the fact that about 30 new members are joining weekly.

Treasurer Bill Hook (W3QBC) presented the Financial Report, also printed elsewhere in this Newsletter, as well as a companion report on membership.

The flight readiness report on AMSAT-OSCAR 7 was given. President Klein showed an excellent series of slides on the technical details of laboratory testing and integration into the spacecraft. The launch of the satellite at the time was scheduled for November 13. The Vice President of Operations, Bill Tynan (W3KRV), then outlined details of the flight launch network schedule of W3ZM, WA3NAN and W1AW. He advised that it was planned to have the following satellite operating schedule for AMSAT-OSCAR 7.

Monday, Thursday, Saturday:	70/2 Transponder
Tuesday, Friday, Sunday:	2/10 Transponder
Wednesday:	Experiments

President Klein advised that AMSAT-OSCAR 6 was continuing to operate satisfactorily and another year of successful operation was hoped for, if it survives the next period of high temperature solar radiation (December-February).

Bill Dunkerley (WA2INB) gave a report on the ARRL Education Program. This is a service to the non-amateur and serves as a needed and useful adjunct to the NASA Community Involvement Program. To date, copies of the booklet on "Space Science Involvement" have been distributed to over 2,000 educators, primarily teachers in the junior and senior high schools. He stated that there is now an OSCAR exhibit at the Kennedy Space Center.

The results of the election of three new Directors for the next two years were announced:

Dr. Thomas A. Clark, WA3LND/W8IUF
William I. Dunkerley, Jr., WA2INB
Lawrence S. Kayser, VE3QB/VE3RMR

The First and Second Alternates elected are:

Robert J. Carpenter, W3OTC
Richard Zwirko, K1HTV

Under the agenda item of other business there was a general discussion among all present on the following: (1) Best ways of disseminating information on orbits, accessibility of OSCAR and AMSAT in general; (2) AMSAT-OSCAR 7 computer programs; (3) Satellite slide rules; (4) DX-peditions; (5) Mobile operations; (6) Use of telemetry; and (7) Ranging experiments.

Pictures of stations used for amateur satellite communications were solicited and Bill Dunkerley advised of a forthcoming ARRL Special Techniques Handbook. Gary Tater (W3HUC) solicited contributions for an AMSAT handbook on amateur space communications to be published in one of the Amateur Radio Magazines.

The meeting adjourned at 11:15 p.m.

AMSAT-OSCAR 7 SPACE ONLY RTTY KEYING

The space tone only or single tone on-off RTTY keying heard on the 145.98 MHz beacon is an operational but previously unpublished mode of operation.

MINUTES OF THE BOARD OF DIRECTORS MEETING

10 November 1974

The Board met at 10:35 a.m. at the home of Dr. Perry I. Klein, K3JTE, with the following in attendance:

Perry Klein, K3JTE	Bill Hook, W3QBC
Bill Dunkerley, WA2INB	Rich Zwirko, K1HTV
Tom Clark, WA3LND	Jan King, W3GEY
Chuck Dorian, W3JPT	Bill Tynan, W3KMY

The first order of business was the election of officers for 1974-1975. The following were elected:

President:	Perry Klein, K3JTE
Executive Vice President:	Jan King, W3GEY
Vice President, Operations:	Bill Tynan, W3KMY
Secretary	Chuck Dorian, W3JPT
Treasurer	Bill Hook, W3QBC

The following were appointed to the positions indicated:

Membership Chairman:	Dick Coan, W3CPU
Manager, Command Stations:	Randy Smith, VE2BYG
Director of Information and Publicity:	Joe Kasser, G3ZCZ
Assistant Director of Information and Publicity:	Gary Tater, W3HUC
Newsletter Editor:	Joe Kasser, G3ZCZ
Manager, Information Bulletin Stations:	Vic Politi, W1NU
Manager, AMSAT Education Bulletin Stations:	Fred Merry, W2GN

An offer to become QSL Manager for AMSAT was received from Dennis Grinerod, WA1EHF. It was agreed to accept his offer. It was also noted that the use of the existing QSL bureau services should be encouraged (see notice!).

The employment contract for President Klein was discussed and action deferred until the December meeting of the Board of Directors. Further explanation of sources of income and planned expenses need to be validated before a final offer can be made.

Prospective sources of income for 1975 were examined. Major discussion centered on a proposed increase in dues and funds anticipated from ARRL and the ARRL Foundation. It was proposed to increase dues in 1975. Reasons for the increase include:

1. Increased costs for all services -- printing, postage, paper.
2. Limited income from other sources.
3. Need to continue 1975 expenses at same level as 1974.
4. Anticipated liabilities \$6,000 greater than assets.
5. Slower than expected contributions to ARRL Foundation.

After discussion it was agreed to increase the dues to \$10.00 US for individuals and \$20.00 US for member societies per year as of 1 July 1975. It was felt that this would allow sufficient time for notification to members and for the necessary changes to the By-Laws. Concurrently with the individual dues increase, the contributions necessary for consideration for Life Membership would be increased to \$100.00 US for individuals and \$200.00 US for Member Societies. Family memberships would continue to be \$2.00 per additional family member.

In order to encourage greater membership it was agreed to establish a 10% rebate to member societies for memberships that are submitted in bulk by the society. This will permit a reduction in the paperwork involved and hopefully broaden our membership. A new category of Student membership was established for bona fide students under the age of 18 years, at a rate of 50% of the annual dues.

MINUTES OF THE BOARD OF DIRECTORS MEETING

7 December 1974

The Board met at 11:00 a.m. at the NASA Goddard Space Flight Center, with the following in attendance:

Perry Klein, K3JTE
Bill Tynan, W3KMV
Jan King, W3GEY
Bill Dunkerley, WA2INB

Tom Clark, WA3LND/W8IUF
Larry Kayser, VE3QB (by telephone)
Dick Daniels, WA4DGU

The Board approved an expenditure of about \$175 for an additional MITE Teleprinter.

The Board discussed a letter from Mexican representatives of the L.M.R.E. proposing the establishment of an AMSAT-MEXICO organization. K3JTE will provide them with guidance information.

The mailing of the December Newsletter was discussed and it was decided that, in advance of the normal Newsletter mailing, K3JTE would prepare a special mailing to all members containing orbital data and information on the revised operating schedule for OSCAR 7. This mailing will go via first class in order to insure timely arrival through the holidays.

Protracted discussion on the operations schedule for AMSAT-OSCAR 7 then ensued. After much discussion, it was finally decided that the operations schedule would have the following salient points:

A. AMSAT-OSCAR 7 will normally be in Mode A on odd-numbered days of the year and in Mode B on even-numbered days. The problem of two adjacent odd days on December 31 and January 1 was settled by ordaining that both shall be Mode A.

B. Wednesdays shall be reserved for AMSAT-OSCAR 7 experiments and bulletins on a pre-arranged basis. The operational mode shall be that defined by the odd/even day of the year. On either Tuesday or Wednesday when the satellite is in Mode A, command exercising and spacecraft checkout will be conducted. The use of the experiments day for bulletins is a new feature. The Vice President in charge of Operations, W3KMV, will arrange with foreign member societies and existing bulletin stations to ensure that this will be accomplished in an expeditious manner. The Board affirmed the position that all experiments must be coordinated by AMSAT and that all non-scheduled operations will be discouraged.

C. The use of CODESTORE on the beacons was discussed. The use of CODESTORE for "personal" messages was discouraged, although it was recognized that VE2BYG and VE3QB have a valid use in relaying information to the Australian command stations. Such use of CODESTORE must be coordinated through AMSAT. It was further decided that on Sundays, telemetry would be sacrificed and CODESTORE be used for world-wide message transmissions. All CODESTORE messages must be prefaced with the satellite's (abbreviated) call letters "HI" (for W3OHI).

D. The 435.1 Beacon was discussed, particularly in light of the "inverted Doppler" experiments in progress by Ron Dunbar, W0MJS, and John Fox, W0LER. The beacon will be on for those orbits which permit the experiments to be carried out.

E. The use of AMSAT-OSCAR 6 and AMSAT-OSCAR 7 for the educational program was discussed. The only departure from previous schedules will be that AMSAT-OSCAR 6 will be commanded ON for the non-mode A days of OSCAR 7, Monday through Friday, for morning passes (north-to-south) as arranged by the ARRL, WA2INB and the educational bulletin stations. This will permit two-to-ten meter demonstrations on any morning of the week. This is the only change in AMSAT-OSCAR 6 operations.

F. In order to disseminate this schedule to the users, K3JTE is instructed to work out a simple calendar and make it available to the users as quickly as possible.

The Board then discussed the command station situation. A report from G3IOR that G3YJO at the University of Surrey was now testing his command system was read. It was noted that this was quite timely since CN8BO is due to return to the U.S. in the near future and additional European capability is required to make AMSAT-OSCAR 6 usable. The requirement for a permanent Washington-area command capability was noted. K3JTE indicated that he would have some command capability soon, pending problems with antennas on his apartment house. W3GEY and WA3LND indicated their possible availability for command duties.

The Board decided that it would be desirable to hold an experimenters conference to define hardware for future missions. An appropriate time for such a meeting was established as late March or early April of 1975. After considerable discussions as to location of such a meeting, it was decided that the Washington area would be most cost-effective. It is planned that this meeting would be attended by Australian, German, Canadian, U.S. and possibly Dutch representatives. K3JTE will work out the details and issue invitations.

A long discussion ensued regarding future plans. As currently planned by W3GEY, K3JTE and DJ4ZC, the next launch would be around 1980 to synchronous altitude. W3KMY, WA2INB and WA3LND expressed strong reservations that an additional AMSAT-OSCAR 6 or AMSAT-OSCAR 7 type payload in the 1977 time-frame would be desirable, particularly in view of the probable finite lifetimes of AMSAT-OSCAR 6 and AMSAT-OSCAR 7. W3GEY discussed possible launch opportunities in that period, but indicated that he felt strongly that the present design team would not be able to undertake both a synchronous and an additional low-altitude payload. It was agreed that a new individual would have to appear on the scene to take on the management duties for such a low altitude satellite. K3JTE will begin scouring the countryside looking for a qualified engineer willing to carry out such a program. AMSAT has been contacted by a NASA contractor who is interested in studying the reliability of low-cost payloads using "plastic" IC's and other "non-qualified" components. K3JTE will pursue this lead as a possible source of funding. The existing Mark II printed circuit version of the two-to-ten meter translator design (which is now in a state of limbo) will be provided to VE3QB for evaluation, as soon as K3JTE can get it ready. This can serve as an "off-the-shelf" payload for target-of-opportunity launches in the future.

The possibility of obtaining some portable OSCAR terminals for DXpedition and emergency communications use was then discussed. WA3LND has been in touch with JALANG concerning the small SSB/CW transceivers available in Japan but not yet in the U.S. W3KMY indicated that one such unit would be available in the U.S. in the next two months. It was agreed that the desirable characteristics of a portable unit would include small size, light weight, receive-while-transmit if possible, about 50 watts rf, SSB/CW modes, and if possible the capability of using the two-to-ten meter and 70cm-to-2 meter translators. WA3LND will check into the technical details. WA2INB will explore possible funding sources.

After considerable discussion, it was agreed that the Board would renew K3JTE's agreement as fulltime President of AMSAT. One of the major concerns on the part of the Board was the availability of future funding. The agreement contains a clause which permits the Board to terminate the contract on 30 days' notice, and the Board went on record that it will not permit deficit funding. For example, AMSAT will not tap its membership escrow accounts of prepaid and Life member dues to pay salaries. It was agreed by all that the continued health of the amateur satellite program was critically dependent on obtaining sizable donations through sources such as the ARRL Foundation. K3JTE indicated that he is pursuing additional funding sources vigorously.

The Board discussed the statement made in HAM RADIO and HR REPORTS that these publications were THE official source of AMSAT news. WA2INB indicated that these statements had already caused some concern. The Board agreed that any publication serving the amateur community was encouraged to carry AMSAT information and that NO PUBLICATION WAS TO BE GIVEN EXCLUSIVE RIGHTS. K3JTE was instructed to contact the publisher, Skip Tenney, and seek to rectify the erroneous statement.

The meeting was adjourned at approximately 17:00.

T. Clark, WA3LND/WØIUF

OSCAR WORKED ALL STATES AWARD

During the early phases of two-way communications via OSCAR, AMSAT has awarded trophies to the pioneering amateurs who first achieved Worked All States. At AMSAT's request, the ARRL has now amended its WAS rules to permit qualification for this award through contacts made exclusively via OSCAR satellites. A specially endorsed WAS certificate will be issued by ARRL to successful applicants. WAS application forms are available on request from ARRL Headquarters in return for a self-addressed stamped envelope.

AMSAT FINANCIAL REPORT

By William A. Hook, W3QBC

Statement of Receipts and Expenses

January 1 to September 30, 1974

ASSETS: January 1, 1974 \$ 8,858.05

RECEIPTS: Dues (Note 1) \$ 5,471.42
 Donations (Note 2) 37,839.34
 Refunds 678.98
 Interest 397.53
 Total \$ 44,387.27

EXPENSES: Postage and Shipping \$ 1,511.87
 Office Supplies 415.98
 Telephone 459.12
 Printing 2,357.93
 Typing 485.87
 Photography 14.08
 Travel 901.41
 Capital Equipment 162.77
 Components 2,165.44
 Salaries and FICA (Note 3) 25,700.18
 Unemployment Insurance 10.77
 Fees and Miscellaneous 1,017.26
 Total \$ 35,202.68

EXCESS OF INCOME OVER EXPENSES \$ 9,184.59

ASSETS: General Checking Account \$ 1,413.56
 Payroll Checking Account 1,962.54
 Savings Accounts 14,666.54
 Total Assets (September 30, 1974) \$ 18,042.64

Note 1: Dues received from: Individuals, \$4,901.16; Families, \$46.00; and Member Societies, \$524.26.

Note 2: Donations included: \$30,219.12 from the American Radio Relay League; \$1,871.47 from the ARRL Foundation, Inc.; \$666.66 from the International Amateur Radio Union - Region I; \$337.06 from Project OSCAR; \$4,160.90 from individuals and societies applying for life membership and \$584.13 from others.

Note 3: Salaries plus 5.85% Social Security contributions for Technician Marie Marr and Engineer Dr. Perry I. Klein.

PUBLICITY PHOTOS WANTED

Black and white photographs of users at their stations are wanted by the AMSAT Information and Publicity Department. If you have any such photos and would like to see them displayed in public, please send them to AMSAT in care of the Director of Information and Publicity.

MEMBERSHIP REPORT

By William A. Hook, W3QBC

	<u>Aug. 1, 1973</u>	<u>Oct. 31, 1974</u>	<u>Increase</u>
Individual and Family	954	1,559	605
Member Societies	<u>60</u>	<u>69</u>	<u>9</u>
Totals	1,014	1,628	614 (61%)
<u>including:</u>			
Life Members	0	109	109
Life Member Societies	0	6	6

59 Countries Represented

American Samoa	Hong Kong	Norway
Angola	Hungary	Peru
Argentina	Iceland	Philippines
Australia	India	Poland
Austria	Ireland	Portugal
Belgium	Israel	Puerto Rico
Brazil	Italy	Republic of South Africa
Bulgaria	Japan	Rhodesia
Burundi	Jordan	Scotland
Canada	Kenya	Spain
Chile	Libyan Arab Republic	Sri Lanka
Colombia	Madeira Islands	Surinam
Czechoslovakia	Malaysia	Sweden
Denmark	Malta	Switzerland
England	Marshall Islands	Uruguay
Finland	Mexico	United States
France	Netherlands	Venezuela
Germany	Netherlands Antilles	Wales
Greece	New Zealand	Yugoslavia
Guam	Nigeria	

AMSAT Member Societies

Dayton Amateur Radio Association Dayton, Ohio	Montreal Amateur Radio Club, Inc. Westmont, P.Q., CANADA
Goddard Amateur Radio Club Greenbelt, Maryland	Hampden County Radio Assn. Southwick, Massachusetts
Radio Society of Sri Lanka Colombo, SRI LANKA	Deutscher Amateur Radio Club Kiel, GERMANY
*Union Schweizerischer Kurzwellen- Amateure Seegraben, SWITZERLAND	Mt. Airy VHF Radio Club Elkins Park, Pennsylvania
*Radio Society of Great Britain London, ENGLAND	Wheatbelt Radio Club Goodland, Kansas
VE2RM Incorporated Pointe Claire, Dorval, P.Q., CANADA	Johns Hopkins APL Radio Club Silver Spring, Maryland
Sun City Amateur Radio Club, Inc. El Paso, Texas	ARINC Amateur Radio Society Annapolis, Maryland

*Central States VHF Society Boulder, Colorado	Straits Area Radio Club Petoskey, Michigan
Swedish Amateur Radio Society Enskede, SWEDEN	Japan Amateur Radio League, Inc. Tokyo, JAPAN
Radio Club Argentino Buenos Aires, ARGENTINA	Connecticut Wireless Association, Inc. Bristol, Connecticut
Natl. Insts. Health Radio Amateur Club Bethesda, Maryland	OK7ULZ VHF Group Praha, CZECHOSLOVAKIA
Philippine Amateur Radio Assn. Manila, PHILIPPINES	Wireless Institute of Australia Brisbane, Queensland, AUSTRALIA
Rome Radio Club, Inc. Rome, New York	Christchurch VHF Group Christchurch, NEW ZEALAND
Verband der Funkamateure der Deutschen Bundpost Bamberg, WEST GERMANY	Tidewater Amateur Radio Club Norfolk, Virginia
JPL Amateur Radio Club Pasadena, California	Newport County Radio Club Newport, Rhode Island
Kokomo Firebird Radio Club Kokomo, Indiana	The New Zealand Association of Radio Transmitters, Inc. Christchurch, NEW ZEALAND
Huntsville Amateur Radio Club Huntsville, Alabama	Liga Mexicana de Radioexperimentadores A. C. Mexico D. F., MEXICO
Two Meter Association Tokyo, JAPAN	Ambassador College Satellite Stn. Herts, ENGLAND
Central Mass. Amateur Radio Assn. Spencer, Massachusetts	Goldcoast Radio Club Southport, Queensland, AUSTRALIA
Ottawa Amateur Radio Club Ontario, CANADA	Rock Creek Amateur Radio Assn. Chevy Chase, Maryland
Northstar Highbanders Amateur Radio Club Minneapolis, Minnesota	Carone Philippe Radio Club Rouen, FRANCE
*Department of State Amateur Radio Club Washington, District of Columbia	Volkssternwarte Clubstn. Bochum, Sundern, WEST GERMANY
MIT Radio Society Cambridge, Massachusetts	San Bernardino Microwave Society, Inc. Corona, California
Montgomery Amateur Radio Club Gaithersburg, Maryland	Mike and Key Radio Club of Seattle Tacoma, Washington
Huron Valley Amateur Radio Club Ypsilanti, Michigan	Circulo Nacional de VHF - Santiago Santiago, CHILE
Akademisk Radioklubb Trondheim, NORWAY	*Dade Radio Club Miami, Florida
Roanoke Valley Amateur Radio Club, Inc. Roanoke, Virginia	Irish Radio Transmitters Society Dublin, IRELAND
East Lancashire Amateur Radio Club Clitheroe, Lancashire, ENGLAND	TRW Systems Amateur Radio Club Redondo Beach, California
Opportunity School Amateur Radio Club Denver, Colorado	Southern Peninsula Amateur Radio Klub Hampton, Virginia

Findlay Radio Club
Findlay, Ohio

Satellite Amateur Radio Club
Vandenberg AFB, California

*Dallas Amateur Radio Club
Dallas, Texas

Keesler Amateur Radio Club
Keesler AFB, Mississippi

Lewiston-Clarkston Amateur Radio
Club, Inc.
Clarkston, Washington

Malev's Radio Club
Budapest, HUNGARY

Calgary Amateur Radio Club
Calgary, Alberta, CANADA

Brooklyn College Amateur Radio Society
Brooklyn, New York

New Orleans VHF Club
New Orleans, Louisiana

Martin-Marietta Aerospace Amateur
Radio Club
Denver, Colorado

Telesat Canada
Lake Cowichan, British Columbia, CANADA

Icelandic Radio Amateurs
Reykjavik, ICELAND

* Life Member Society

The above member societies are listed in the order of joining AMSAT.

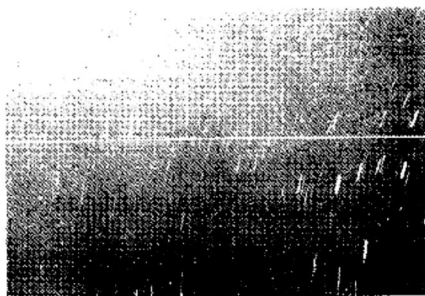
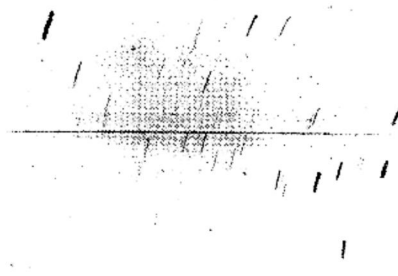
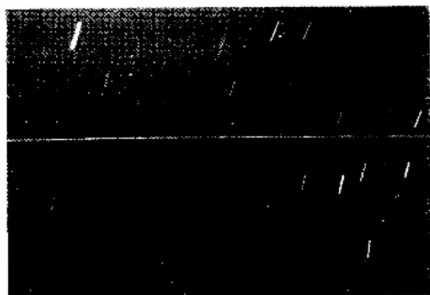
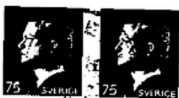


PHOTO-TRACKING OF OSCAR 6

These photographs were sent in by Otmar K. Pepp, DL3SX, and show the tracks of ITOS-D and AMSAT-OSCAR 6 on orbit 4609 (18 Oct. 73) taken from Munich, Germany, using infra red film.





"LETTERS AND COMMENTS"

Dear Reader,

This is to introduce your new Editor who was born in London, England, about 28 years ago, was first licensed as G8ETB in 1968 and received his present call prior to his coming to the USA just under five years ago. His interests in Amateur Radio are numerous and include VHF, OSCAR, Contests, RTTY, homebrewing and mobile operation. His many other hobbies include writing, photography and stamp collecting.

Joe Kasser, G3ZCZ



Joe,

I was listening to AMSAT-OSCAR 6 on Orbit 9595 and have never heard it so lightly loaded. Tell people not to forget about OSCAR 6 now that 7 is up.

Tom Clark, WA3LND



Dear Perry,

Congratulations for a successful launch! They tell me that the 435.1 MHz beacon is very loud and clear and at my place the 29.502 MHz beacon is coming in so well that it's almost hard to believe that those signals are actually coming from space!

Here is a very brief report (as of November 17th):

(1) The JA8 boys picked up the 70cm beacon on orbit 2.

(2) As soon as mode D changed over to mode A a lot of activity showed here in Japan,

(3) On orbit 18 JA6PX in Niigata City worked OH2RK in Finland for a very first dx contact via OSCAR 7 from Japan.

(Continued--bottom of next column)

Dear Editor:

The undersigned proposes to put together a book on the subject of Radio Amateurs in Space. To make such a book possible and to be representative of all of those throughout the world who have contributed or participated in the OSCAR program and related activities through AMSAT and PROJECT OSCAR, inputs would be appreciated from those participants. The inputs should describe the contribution technologically, the persons involved, and the results. Photographs or copies of photos would be desirable showing the apparatus and people in the programs discussed. We already have some inputs from Project OSCAR and from the TRW Radio Club regarding their respective activities. K6GSJ has made all of his photos available. We're attempting to get an input from W6ZGC who put up the first tracking station for amateur radio use to track and listen to the Russian Sputnik, man's first orbiting spacecraft which generated signals to be received by radio.

The undersigned will collect all of the material, act as compiler and editor and be generally responsible for the material received. It is urged that all who had any connection with space communication projects related to or participated in by radio amateurs communicate their inputs to me at the address given below.

73's

Norman L. Chalfin, K6PGX

P. O. Box 463
Pasadena, Calif., USA 91102

(continued)

(4) Reports have come to me that both K7BBO and KL7MF were heard in JA8 land,

(5) Active stations in the above area include JA8ARS, JA8DJJ and JA8PL. Needless to mention they are located way up north and have a tremendous advantage in satellite work.

Haruo Yoneda, JALANG
AMSAT Liaison for Japan
and Southeast Asia

"Letters and Comments" (Continued)

Dear Sirs,

Is OSCAR 7 a secret mission? We have been trying to get information on orbital times without success. On 14,280 kHz we cannot hear the state-side stations nor any Europeans at 1800 GMT. On the 15th we heard GB2SM with the countdown and informing that it was up, but this station on 3780 kHz was under a commercial station, which was S9+40 to 60 db. Trying to move him up 1 kHz for less grm was to no avail. G3IOR we have not heard to date, nor CN8BO. No news reached us about the delay from the 13th to the 15th of November. Phoning OH2RK a couple of times gave no info or showed a lack of interest in giving away the info he possibly had. Having worked through OSCAR 6 and sending reports to AMSAT I thought would bring us further reports on OSCAR 6 and now OSCAR 7. The Swedish Radio Amateur Bulletin on Sundays is relaying on my fast info about orbital data, but it would be nice to be able to check one's calculations against yours professionally obtained.

73,

H. Granholm, OHØNC

There's a European net on Sundays listed elsewhere in the Newsletter, which is supplying up-to-date information, . . . Ed.)



Joe,

I have access to a number of computers and am working on Computer Programs for processing the AMSAT-OSCAR 7 RTTY telemetry data. I plan to connect the computer up to a terminal unit and have another station access the computer, initially over a 2 meter FM link, feed the data to the computer and have it reply with processed and formatted data.

I also intend to feed real-time data from the spacecraft to the computer during a pass and have it feed real-time processed RTTY data over the local AMSAT 2 Meter repeater.

I am interested in communicating or corresponding with any AMSAT members who are equipped for RTTY and who are copying the telemetry.

Dave Mills, W3HCF
3907 Beechwood Rd.
Hyattsville, MD 20782

(Dave, that's a good idea. Perhaps we could also set up a 20 meter net on say 14,085 kHz to pass the RTTY telemetry data to the computer. We could also transmit orbit bulletins, etc. on that net. Anyone interested in being net control or taking part? . . . Ed.)

(Continued from Page 24)

In continuation of the discussion of the financial aspects of the 1975 budget, it was agreed to request \$6,000 from ARRL for administrative expenses and \$20,500 from the ARRL Foundation for support of AMSAT-OSCAR 6 and 7 operations.

In a discussion of potential AMSAT projects for 1975 and on, Jan King mentioned the following:

1. A 10 watt 144/435 MHz linear translator (presently being developed by Karl Meinzer, DJ4ZC).
2. A Pulse Code Modulation Telemetry System.
3. A Digital Satellite Command System.
4. Microprocessor Spacecraft Control Systems.
5. Analog Telemetry System.

It was urged by Bill Tynan and Bill Dunkerley that to this list be added an advanced 2/10 meter translator offering higher performance. This was agreed, and it was further agreed that the PC version of the present 2/10 Translator design be sent to Larry Kayser, VE3QB, for further development.

Charles Dorian, W3JPT
Secretary

AMSAT GRATEFULLY ACKNOWLEDGES DONATIONS OF \$50.00 OR MORE FROM THE FOLLOWING SUPPORTERS WHO HAVE RECENTLY BECOME LIFE MEMBERS

LM-88	N. Thillozen		St. Egrève, France
LM-89	Dr. William J. Webster, Jr.	WB2TNC/3	Seabrook, Maryland
LM-90	W. J. Stewart	W4UBE	Annandale, Virginia
LM-91	W. Stannard Morgan	WB9BRF	Pipestone, Minnesota
LM-92	A. L. Fuiks	K5RHP	Dallas, Texas
LM-93	Dr. Dieter Teuber	WB4UGQ	Huntsville, Alabama
LM-94	Bruce Frahm	WA8TAS	Colby, Kansas
LM-95	Tom Case	K8CLA	Cincinnati, Ohio
LM-96	R. K. Byzet	WA4PRK	Memphis, Tennessee
LM-97	R. R. Adams	W8BKO	Columbus, Ohio
LM-98	C. J. Bolvin	K4KQ	Miami, Florida
LM-99	Charles Dorian	W3JPT	Washington, D. C.
LM-100	C. F. Schultz	W6CG	Anaheim, California
LM-101	Ben F. Bissman, III	W8HXT	Mansfield, Ohio
LM-102	E. R. Oxner	W6HMA	Lompoc, California
LM-103	Dr. Earl F. Skelton	WA3THD	Washington, D. C.
LM-104	Nat Schnoll	W2PN	Upper Saddle River, New Jersey
LM-105	Joe Kasser	G3ZCZ	Silver Spring, Maryland
LM-106	W. K. Izuo	KH6BWT	Honolulu, Hawaii
LM-107	Karl H. Burckardt		Herrenberg, West Germany
LM-108	Michael Marneris	K8ERL	Mayfield Heights, Ohio
LM-109	Finn Jensen	LA8YB	Nesbru, Norway
LM-110	H. G. Wightman	VE5XU	Regina, Saskatchewan, Canada
LM-111	Karl W. Klein	W6DOW	Carson, California
LM-112	A. A. Simpson	VE4AS	Winnipeg, Manitoba, Canada
LM-113	Arthur H. Feller	W4ART	Arlington, Virginia
LM-114	David Sumner	K1ZND	West Hartford, Connecticut
LM-115	Philippe Fouquemberg		Kain, Belgium
LM-116	M. W. Hughes	K6KSY	Palos Verdes Peninsula, California
LM-117	O. H. Mitchell	W8NA	Charleston, West Virginia
LM-118	A. G. Norris	W7SFA	Issaquah, Washington
LM-119	Jim Sheward, Jr.	K8ZCG	Upper Sandusky, Ohio
LM-120	R. E. Crumrine	WB2DNN	Rochester, New York
LM-121	John R. Low	K3YHR	Newark, Delaware
LM-122	Wolfram Boettcher	YV4WT	Maracay, Venezuela
LM-123	Vic Politi	W1NU	Fairfield, Connecticut
LM-124	Fred Siebert	K3PNL	Laurel, Maryland
LM-125	A. C. Cogle	K4ARD	Petersburg, Virginia
LM-126	Thomas G. Kelley	WA2KLZ	Maple Shade, New Jersey
LM-127	Gordon Reid	VE6AK	Edmonton, Alberta, Canada
LM-128	Edward Ramos	W3HQH	Washington, D. C.
LM-129	Gary Tater	W3HUC	Ellicott City, Maryland

AMSAT-OSCAR QSL BUREAUS

Tony Bailey, G3WPO, 5 Erin Way, Burgess Hill, RH15 9PN, England, has agreed to forward all incoming AMSAT-OSCAR 6 and 7 QSL cards destined for "OSCAR News" subscribers in the British Isles (G, GC, GD, GI, GM and GW satellite users). For those not already familiar with it, "OSCAR News" is a regular U.K. publication designed to inform and assist all users of OSCAR satellites. The publication contains excellent operating tips, orbital data and information on DX activity through the OSCAR satellites. Tony or Pat (G3IOR, 17 Heath Crescent, Hellesdon, Norwich NOR 58N, England) may be contacted directly for subscription details.

Dennis Grinerod, WALEHF, 288 Grand St., Bridgeport, Conn. 06604, has agreed to serve as AMSAT QSL Manager in the following manner:

- (a) All users to send him several SASE's which will be filled by incoming cards and mailed when full.
- (b) DX - QSL's incoming and outgoing: Outgoing cards will be forwarded at a rate of 6¢ per card or 20 cards for a dollar.
- (c) Domestic - QSL's: Send him your US and Canadian cards in bulk. These will be sorted and placed in the SASE's.

The service is already in operation.

AMSAT LOGO STICKERS

These stickers are printed in black on a fluorescent red background. They are pressure sensitive and will stick to anything including QSL cards and envelopes.

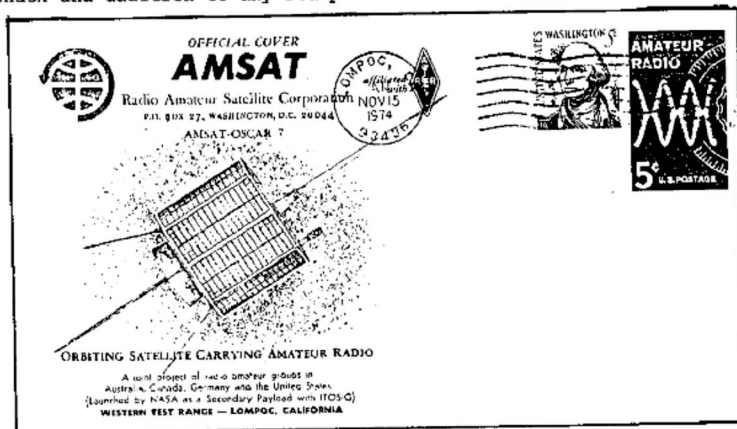


They come in sheets of 48 and may be obtained from David Middleton, W7ZC, Box 303, Springdale, Utah 84767, for only \$1.25 postpaid.

(Be the first in your call area to have stuck-up QSL cards . . . ed)

AMSAT-OSCAR 7 FIRST DAY COVERS AVAILABLE

Official first-day covers commemorating the launch of AMSAT-OSCAR 7 are now available from AMSAT @ \$1.00 each (or 5 IRC's) and one business size (#10) self-addressed, stamped envelope (or an additional IRC in lieu of stamps). The first-day cover envelopes were postmarked at the launch site, Lompoc, California, on the day of the launch. It is an excellent collector's item for the Hamshack and addition to any stamp collection.



AMSAT-OSCAR 6 AND 7 SLIDES AVAILABLE

The JPL Amateur Radio Club is sponsoring a set of AMSAT-OSCAR slides depicting the following:

1. AMSAT-OSCAR 6 (Delta 91) lift off
2. AMSAT-OSCAR 6 alongside ITOS D aboard the Delta rocket
3. AMSAT-OSCAR 6 mated to the rocket - detail
4. AMSAT-OSCAR 6 interior showing memorial plaque to W3ZM
5. AMSAT-OSCAR 7 - exterior view

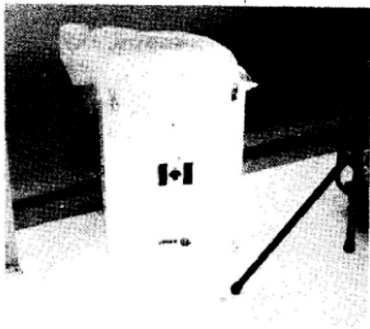


These slides are available for \$1.20 postpaid (Foreign, please add 58¢ (air) or 25¢ (surface) payment may be in IRC's), from Dr. N. Chalfin, K6PGX, P.O. Box 463, Pasadena, California 91102.

AMSAT-OSCAR 7 SHIPPING CONTAINER AVAILABLE

A special souvenir from the AMSAT-OSCAR 7 hardware development program is now being offered to the highest donor:

AMSAT-OSCAR 7 shipping container -- This wooden box, measuring 33" x 23½" x 23½", was used to transport the spacecraft numerous times during the past year. The container is painted white and bears the Australian, Canadian, German and American flags about its four sides. The container weighs about 75 pounds and is a unique conversation piece for the shack (or living room).



Views of shipping container, K6JRR (left) and WB6JNP (right) shown helping to transport AMSAT-OSCAR 7 from Los Angeles to the Western Test Range, Lompoc, California.

COMPUTER/CALCULATOR PROGRAMS AVAILABLE

Dr. Tom Clark, WA3LND/WØIUF, has the following programs suitable for use on Hewlett-Packard Equipment and is prepared to forward copies on request to anyone interested.

HP 65 Calculator: Program to calculate equatorial crossing times for both spacecraft. Send two program sticks (in folders and a #10 sized SASE) for a listing and programmed sticks.

HP 9830: Programs to calculate AZ-El data for your Qth, as well as the crossing times. Send a data cassette and return postage for a programmed tape and listing.

Communicate with Tom directly at 13107 Claxton Drive, Laurel, Maryland 20811, USA.

HR REPORT TO CARRY AMSAT NEWS

AMSAT has a new "fast reaction" news vehicle -- effective immediately, HR Report, the twice-monthly newsletter put out by Ham Radio Magazine, is carrying late-breaking AMSAT news on a regular basis. In addition, HR Report is also distributing the monthly orbital predictions for both OSCAR 6 and OSCAR 7.

By special arrangement with HR Report publisher W1NLB and editor W9JUV, AMSAT members can receive a U.S. \$2 discount on an HR Report subscription. Regular rates are U.S. \$12 per year for U.S., Canada and Mexico and U.S. \$15 for the rest of the world, all airmail. AMSAT members need pay only U.S. \$10 and U.S. \$13 respectively -- send your check to HR Report, Greenville, New Hampshire 03048 U.S.A., and be sure to include your AMSAT number with your subscription request.

SECOND MEMBERSHIP RENEWAL NOTICE - FOR THOSE WHO HAVE NOT RENEWED

As mentioned in past issues of the Newsletter, AMSAT has changed to an end-of-year billing for renewals. From now on all memberships will expire at the end of a calendar year. This simpler procedure is followed by many societies like AMSAT whose membership records are kept by a volunteer staff.

A renewal envelope is included in this Newsletter for renewal of your membership. Please check your mailing label for accuracy and to determine the amount to remit. Explanation of the top line of label:

<u>Expiration Date</u>	<u>Coding (See form below)</u>	<u>Member No.</u>
10-74	ACEGH	123

Renewal Payment Table

<u>Month Membership Expires (from Label)</u>	<u>Pay This to Renew Through 1975</u>	<u>Pay This to Renew Through 1976</u>
12-74	\$ 5.00	\$ 10.00
02-75	4.17	9.17
04-75	3.33	8.33
06-75	2.50	7.50
08-75	1.67	6.67
10-75	0.83	5.83
12-75	0	5.00

- A - Hold an amateur license.
- B - Do not hold a license.
- C - Member of the ARRL.
- D - Non-member of ARRL.
- E - Will participate actively in AMSAT activities.
- F - Do not desire to actively participate.
- G - Capabilities lie in technical areas.
- H - Capabilities lie in administrative areas.

LIFE MEMBERSHIPS

The AMSAT Board of Directors has approved the granting of Life Memberships to those individuals contributing \$50.00 or more and to societies donating \$100.00 and upward. Life Members will be assigned a new Life Member number and will receive a membership certificate and card indicating their new status as well as an OSCAR 6 satellite pin. Application may be made using the renewal envelope enclosed in this issue. Please note that as mentioned elsewhere in this issue this amount is to be raised soon.

AMSAT
P.O. Box 27
Washington, D.C. 20044

RETURN POSTAGE GUARANTEED



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